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.

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

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Column Size Length 8 Inner Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULTRON ES-OVM (Narrow Bore)</td>
<td>5</td>
<td>150 8 2.0</td>
</tr>
<tr>
<td>ULTRON ES-OVM (for Analytical)</td>
<td>5</td>
<td>150 8 4.6</td>
</tr>
<tr>
<td>ULTRON ES-OVM (for Analytical)</td>
<td>5</td>
<td>150 8 6.0</td>
</tr>
<tr>
<td>ULTRON ES-OVM.G (Guard Column)</td>
<td>10</td>
<td>10 8 4.0</td>
</tr>
<tr>
<td>ULTRON ES-OVM (for Analytical)</td>
<td>10</td>
<td>250 8 4.6</td>
</tr>
<tr>
<td>ULTRON ES-OVM Prep (for Preparative)</td>
<td>10</td>
<td>250 8 20.0</td>
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<tr>
<td>ULTRON ES-OVM Prep.G (Guard Column for Preparative)</td>
<td>10</td>
<td>15 8 8.0</td>
</tr>
<tr>
<td>ULTRON ES-OVM (Two Guard Cartridges)</td>
<td>5</td>
<td>5 8 2.0</td>
</tr>
<tr>
<td>ULTRON ES-OVM (Two Guard Cartridges)</td>
<td>5</td>
<td>10 8 4.6</td>
</tr>
<tr>
<td>Holder for Guard Cartridge (with Adaptor)</td>
<td>For 5 8 2.0 mm column</td>
<td></td>
</tr>
<tr>
<td>Holder for Guard Cartridge (with Adaptor)</td>
<td>For 10 8 4.6 mm column</td>
<td></td>
</tr>
</tbody>
</table>

**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 ß-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

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Column Size Length 8 Inner Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULTRON ES-PEPSIN (for Analytical)</td>
<td>5</td>
<td>150 8 4.6</td>
</tr>
<tr>
<td>ULTRON ES-PEPSIN.G (Guard Column)</td>
<td>5</td>
<td>10 8 4.0</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Length ▪ Inner Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULTRON ES-BSA (for Analytical)</td>
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<td>150 ▪ 4.6</td>
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<tr>
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<td>10 ▪ 4.0</td>
</tr>
</tbody>
</table>

ULTRON ES-CD

ULTRON ES-PhCD

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

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Column Size</th>
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</tr>
<tr>
<td>ULTRON ES-CD.G (Guard Column)</td>
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</tr>
<tr>
<td>ULTRON ES-CD (Two Guard Cartridges)</td>
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<td>5 ▪ 2.0</td>
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<tr>
<td>ULTRON ES-CD (Two Guard Cartridges)</td>
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<td>10 ▪ 4.6</td>
</tr>
<tr>
<td>Holder for Guard Cartridge (with Adaptor)</td>
<td>For 5 ▪ 2.0 mm column</td>
<td></td>
</tr>
<tr>
<td>Holder for Guard Cartridge (with Adaptor)</td>
<td>For 10 ▪ 4.6 mm column</td>
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<td></td>
</tr>
<tr>
<td>Holder for Guard Cartridge (with Adaptor)</td>
<td>For 10 ▪ 4.6 mm column</td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Column Size Length (mm)</th>
<th>Inner Diameter (mm)</th>
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<tr>
<td>ULTRON PS-80H</td>
<td>10</td>
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<tr>
<td>ULTRON PS-80H.G (Guard Column)</td>
<td></td>
<td>250</td>
<td>2.0</td>
</tr>
</tbody>
</table>

The maximum operation pressure: 4.0 MPa
The maximum operation temperature: 90°C
Range of pH in use: pH 2 - 6

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**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
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 \(^\circ\)C.
- 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

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Column Size Length (mm)</th>
<th>Inner Diameter (mm)</th>
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</thead>
<tbody>
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<tr>
<td>ULTRON PS-80N.L</td>
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<td>500</td>
<td>8.0</td>
</tr>
<tr>
<td>ULTRON PS-80C</td>
<td></td>
<td>300</td>
<td>8.0</td>
</tr>
<tr>
<td>ULTRON PS-80C.G</td>
<td></td>
<td>500</td>
<td>8.0</td>
</tr>
<tr>
<td>ULTRON PS-80P</td>
<td></td>
<td>300</td>
<td>8.0</td>
</tr>
<tr>
<td>ULTRON PS-80P.G</td>
<td></td>
<td>500</td>
<td>8.0</td>
</tr>
</tbody>
</table>

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 CL have mechanical strength.

- The maximum operation pressure is 8.0 MPa.
- The maximum operation temperature is 90 \(^\circ\)C.

### HPLC Column For Glucuronic Acid In Health Drink

<table>
<thead>
<tr>
<th>Column</th>
<th>Column Size Length (mm)</th>
<th>Inner Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULTRON CL</td>
<td>200</td>
<td>4.6</td>
</tr>
</tbody>
</table>

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 CL have mechanical strength.

- The maximum operation pressure is 8.0 MPa.
- The maximum operation temperature is 90 \(^\circ\)C.
ULTRON VX-SIL

ULTRON VX-SIL is used high purity silica gel of SiO2 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.

<table>
<thead>
<tr>
<th>Particle Size</th>
<th>Pore Size</th>
<th>Specific Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 µm</td>
<td>12 nm</td>
<td>300 m²/g</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<tbody>
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<td>5</td>
<td>150 4.6</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>250 4.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>150 6.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL (for Preparative)</td>
<td>5</td>
<td>250 20.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL (Narrow Bore)</td>
<td>5</td>
<td>150 2.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 2.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>150 1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 1.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL (for Analytical)</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>150 4.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 4.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>150 6.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL (for Preparative)</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 20.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 30.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 50.0</td>
<td></td>
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<tr>
<td>VX-SIL (for Preparative)</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 20.0</td>
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<td></td>
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<td>250 30.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 50.0</td>
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ULTRON VX-SIL.G (Guard Column)

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Length 10</th>
<th>Inner Diameter (mm)</th>
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<tbody>
<tr>
<td>VX-SIL.G (for Analytical )</td>
<td>5</td>
<td>10 4.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL.G (for Preparative )</td>
<td>15</td>
<td>15 8.0</td>
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<tr>
<td>VX-SIL.G (for Analytical )</td>
<td>10</td>
<td>10 4.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL.G (for Preparative )</td>
<td>15</td>
<td>15 8.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL.G (for Analytical )</td>
<td>15</td>
<td>10 4.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL.G (for Preparative )</td>
<td>15</td>
<td>15 8.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL (Two Guard Cartridges)</td>
<td>5</td>
<td>5 2.0</td>
<td></td>
</tr>
<tr>
<td>VX-SIL (Two Guard Cartridges)</td>
<td></td>
<td>10 4.6</td>
<td></td>
</tr>
<tr>
<td>Holder for Guard Cartridge (with Adaptor)</td>
<td>For 5 2.0 mm column</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holder for Guard Cartridge (with Adaptor)</td>
<td>For 10 4.6 mm column</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 µm) 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.

<table>
<thead>
<tr>
<th>Particle Size</th>
<th>Pore Size</th>
<th>Surface Area</th>
<th>Carbon Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 µm</td>
<td>12 nm</td>
<td>300 m²/g</td>
<td>16 %</td>
</tr>
</tbody>
</table>

Reproducibility between column lots

ULTRON VX-ODS columns are checked 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 ў 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.

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Column Size Length</th>
<th>Inner Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VX-ODS (for Analytical)</td>
<td>5</td>
<td>150 ♦ 4.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 ♦ 4.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>150 ♦ 6.0</td>
<td></td>
</tr>
<tr>
<td>VX-ODS (for Preparative)</td>
<td>5</td>
<td>250 ♦ 20.0</td>
<td></td>
</tr>
<tr>
<td>VX-ODS (Narrow Bore)</td>
<td>5</td>
<td>150 ♦ 2.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 ♦ 2.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>150 ♦ 1.0</td>
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<tr>
<td>VX-ODS (for Analytical)</td>
<td>10</td>
<td>150 ♦ 4.6</td>
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<tr>
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<td></td>
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<td></td>
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<td>250 ♦ 50.0</td>
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</tr>
<tr>
<td>VX-ODS (for Analytical)</td>
<td>15</td>
<td>250 ♦ 4.6</td>
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<tr>
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<td>250 ♦ 20.0</td>
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<td></td>
<td>250 ♦ 30.0</td>
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<tr>
<td></td>
<td></td>
<td>250 ♦ 50.0</td>
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</table>

HPLC Column For Reversed Phase (ODS)
ULTRON VX-ODS.G (Guard Column)

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Column Size Length</th>
<th>Inner Diameter (mm)</th>
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<tbody>
<tr>
<td>VX-ODS.G (for Analytical)</td>
<td>5</td>
<td>10</td>
<td>4.0</td>
</tr>
<tr>
<td>VX-ODS.G (for Preparative)</td>
<td>10</td>
<td>15</td>
<td>8.0</td>
</tr>
<tr>
<td>VX-ODS.G (for Analytical)</td>
<td>15</td>
<td>10</td>
<td>4.0</td>
</tr>
<tr>
<td>VX-ODS.G (for Preparative)</td>
<td></td>
<td>15</td>
<td>8.0</td>
</tr>
<tr>
<td>VX-ODS (Two Guard Cartridges)</td>
<td>5</td>
<td>5</td>
<td>2.0</td>
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<tr>
<td>VX-ODS (Two Guard Cartridges)</td>
<td></td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

Holder for Guard Cartridge (with Adaptor)

- For 5 □ 2.0 mm column
- For 10 □ 4.6 mm column

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

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Size (µm)</th>
<th>Column Size Length</th>
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<td>ULTRON VX-Octyl (for Analytical)</td>
<td>5</td>
<td>150</td>
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<td>ULTRON VX-Octyl (for Preparative)</td>
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<td>250</td>
<td>4.6</td>
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<tr>
<td>ULTRON VX-Octyl.G (Guard Column)</td>
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<td>20.0</td>
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<tr>
<td>ULTRON VX-Octyl.G (Guard Column for Preparative)</td>
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<td>10</td>
<td>4.0</td>
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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.

<table>
<thead>
<tr>
<th>Column</th>
<th>Particle Shape</th>
<th>Particle Size</th>
<th>Pore Size</th>
<th>Specific Surface Area</th>
<th>Carbon Content</th>
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<tr>
<td>ODS-II</td>
<td>Spherical Porous Silica Gel</td>
<td>5 µm</td>
<td>12 nm</td>
<td>320 m²/g</td>
<td>17 %</td>
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<tr>
<td>STR ODS-II (Narrow Bore)</td>
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<td>250 Φ 2.0</td>
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<tr>
<td>STR ODS-II (for Analytical)</td>
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<td>100 Φ 4.0</td>
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<td>STR ODS-II (for Analytical)</td>
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<td>150 Φ 4.0</td>
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<td>250 Φ 4.0</td>
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<td>STR ODS-II (for Analytical)</td>
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<td>150 Φ 4.6</td>
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<td>STR ODS-II (for Analytical)</td>
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<td>250 Φ 4.6</td>
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<tr>
<td>STR ODS-II (for Analytical)</td>
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<td>150 Φ 6.0</td>
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<td>STR ODS-II (Guard Column)</td>
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<td>10 Φ 4.0</td>
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<td>STR ODS-II (for Preparative)</td>
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<td>250 Φ 20.0</td>
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<td>STR ODS-II (Guard Column for Preparative)</td>
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<td>150 Φ 4.6</td>
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<td>STR ODS-II PEEK (for Analytical)</td>
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<td>STR ODS-II PEEK (Guard Column)</td>
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<td>Holder for Guard Cartridge (with Adaptor)</td>
<td>For 5 Φ 2.0 mm column</td>
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<td>For 10 Φ 4.6 mm column</td>
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<tr>
<td>Column</td>
<td>Particle Shape</td>
<td>Particle Size</td>
<td>Pore Size</td>
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<td>ODS-M</td>
<td>The Perfect and Spherical Porous Silica Gel</td>
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<td>10 nm</td>
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<td>ULTRON VX-Octyl</td>
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<td>STR ODS-M</td>
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<tr>
<td>INDEX</td>
<td>63</td>
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</table>
-blockers

**Arotinolol**

- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 6.0) / CH$_3$CN = 100 / 5
- Flow Rate: 1.0 mL/min
- Temperature: 25°C
- Detection: UV-220 nm

**Alprenolol**

- Column: ULTRON ES-OVM
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 5.5) / CH$_3$CN = 100 / 10
- Flow Rate: 1.0 mL/min
- Temperature: 25°C
- Detection: UV-220 nm

-blockers

**Bunitrolol**

- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 6.0) / C$_2$H$_5$OH = 100 / 3
- Flow Rate: 1.0 mL/min
- Temperature: 25°C
- Detection: UV-220 nm

**Oxprenolol**

- Column: ULTRON ES-OVM
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 6.0) / CH$_3$CN = 100 / 10
- Flow Rate: 1.2 mL/min
- Temperature: 25°C
- Detection: UV-220 nm
Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 5.5) / C₂H₅OH = 100 / 30
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Pindolol

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 100 / 15
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Bay K 8644

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 5.0) / CH₃CN = 100 / 30
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Prenylamine

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 6.8) / CH₃CN = 100 / 15
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Propranolol

Calcium Antagonists

-blockers
Calcium Antagonists

Verapamil

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 5
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Antiparkinsons

Biperiden

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 10
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Profenamine

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 5
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Trihexyphenidyl

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 10
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm
Antiinflammatoryies

Flurbiprofen

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 3.0) / CH₃CN = 100 / 10
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Ibuprofen

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 3.0) / CH₃CN = 100 / 10
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Ketoprofen

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 3.0) / CH₃CN = 100 / 10
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Pranoprofen

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 3.0) / CH₃CN = 100 / 10
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm
**Antiinflammatoryies**

**Zaltoprofen**
- Column: ULTRON ES-OVM
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 3.0) / CH₃CN = 87 / 13
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Alimemazine**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 25
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Antihistamines**

**Chlorpheniramine**
- Column: ULTRON ES-OVM
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 5.0) / CH₃CN = 100 / 5
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Dimethindene Maleate**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 100 / 9
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm
**Antihistamines**

**Homochlorcyclizine**
- Column: ULTRON ES-OVM
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 4.6) / C$_2$H$_5$OH = 100 / 20
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Promethazine**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 4.6) / C$_2$H$_5$OH = 100 / 7.5
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

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

**Mephobarbital**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 3.0) / CH$_3$CN = 100 / 5
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm
Tranquilizers

**Hydroxyzine**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH2PO4 (pH 4.6) / CH3CN = 100 / 10
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Chlormezanone**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH2PO4 (pH 5.5) / C2H5OH = 100 / 5
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

Skeletal Muscle Relaxants

**Skeletal Muscle Relaxants**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH2PO4 (pH 4.6) / CH3CN = 100 / 10
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Chlorphenesin**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH2PO4 (pH 5.5)
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Eperisone**
- Column: ULTRON ES-OVM
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH2PO4 (pH 5.5) / C2H5OH = 100 / 5
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- 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 KH₂PO₄ (pH 5.5) / C₂H₅OH = 100 / 10
Flow Rate: 1.0 mL/min
Temperature: 25 °C
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 KH₂PO₄ (pH 5.7)
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Antidepressants

Trimipramine Maleate

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.5) / C₂H₅OH = 100 / 30
Flow Rate: 1.0 mL/min
Temperature: 25 °C
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 KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 35
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm
Hypnotics

Glutethimide

Hexobarbital

Anticholinergics

Glycopyrronium Bromide

Mepenzolate Bromide

**ULTRON ES-OVM**

Column: ULTRON ES-OVM  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 10  
Flow Rate: 1.0 mL/min  
Temperature: 25 °C  
Detection: UV-220 nm

Column: ULTRON ES-OVM  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 20 mM KH₂PO₄ (pH 6.0) / C₂H₅OH = 100 / 5  
Flow Rate: 1.0 mL/min  
Temperature: 25 °C  
Detection: UV-220 nm

Column: ULTRON ES-OVM  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 20 mM KH₂PO₄ (pH 5.5) / C₂H₅OH = 100 / 2  
Flow Rate: 1.0 mL/min  
Temperature: 25 °C  
Detection: UV-220 nm

Column: ULTRON ES-OVM  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6)  
Flow Rate: 1.0 mL/min  
Temperature: 25 °C  
Detection: UV-220 nm
Local Anesthetics

Bupivacaine

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 15
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Disopyramide

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 5.5) / C₂H₅OH = 100 / 10
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Antidysrhythmics

Bupropine

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 20
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Cloperastin

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 15
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Antitussives

Benproperine

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / C₂H₅OH = 100 / 20
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Cloperastin
Diuretics

Ethiazide

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

Oral Anticoagulants

Warfarin

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

Bronchodilators

Clorprenaline

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 5.5) / C$_2$H$_5$OH = 100 / 3
Flow Rate: 1.0 mL/min
Temperature: 25 °C
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 KH$_2$PO$_4$ (pH 4.6) / C$_2$H$_5$OH = 100 / 20
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-220 nm
1,2-Diphenylethylamine

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

Flavanone

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

(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 KH$_2$PO$_4$ (pH 4.6) / CH$_3$CN = 100 / 30
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV-254 nm

Benzoin

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

Column: ULTRON ES-OVM
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 100 / 20
Flow Rate: 1.2 mL/min
Temperature: 15 °C
Detection: UV-220 nm
-Blockers

**Alprenolol**
- Column: ULTRON ES-PEPSIN
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 5.0) / C$_2$H$_5$OH = 95 / 5
- Flow Rate: 1.0 mL/min
- Temperature: 25°C
- Detection: UV-220 nm

**Atenolol**
- Column: ULTRON ES-PEPSIN
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 6.0) / C$_2$H$_5$OH = 99 / 1
- Flow Rate: 1.0 mL/min
- Temperature: 25°C
- Detection: UV-220 nm

-Blockers

**Bunitrolol**
- Column: ULTRON ES-PEPSIN
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 5.0) / C$_2$H$_5$OH = 95 / 5
- Flow Rate: 1.0 mL/min
- Temperature: 25°C
- Detection: UV-220 nm

**Terbutaline**
- Column: ULTRON ES-PEPSIN
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 6.0)
- Flow Rate: 1.0 mL/min
- Temperature: 25°C
- Detection: UV-220 nm

Bronchodilators
Antiinflammatoryies

**Ibuprofen**

- Column: ULTRON ES-BSA
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 7.0) / 1-Propanol / Caprylic Acid = 98 / 2 / 0.08
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Pranoprofen**

- Column: ULTRON ES-BSA
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 7.0) / 1-Propanol / Caprylic Acid = 98 / 2 / 0.01
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

Oral Anticoagulants

**Warfarin**

- Column: ULTRON ES-BSA
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 7.0) / 1-Propanol / Caprylic Acid = 98 / 2 / 0.01
- Flow Rate: 1.0 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm
Antihistamines

**Alimemazine**
- Column: ULTRON ES-CD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 5.0) / CH₃CN = 70 / 30
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Chlorpheniramine**
- Column: ULTRON ES-CD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 83 / 17
- Flow Rate: 1.0 mL/min
- Temperature: 15 °C
- Detection: UV-220 nm

Anticonvulsants

**Mephobarbital**
- Column: ULTRON ES-CD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 80 / 20
- Flow Rate: 0.6 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

Skeletal Muscle Relaxants

**Chlormezanone**
- Column: ULTRON ES-CD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 93 / 7
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm
Skeletal Muscle Relaxants

**Eperisone**

- Column: ULTRON ES-CD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 4.6) / CH$_3$CN = 80 / 20
- Flow Rate: 0.6 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Tolperisone**

- Column: ULTRON ES-CD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 4.6) / CH$_3$CN = 85 / 15
- Flow Rate: 1.2 mL/min
- Temperature: 7 °C
- 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$_2$PO$_4$ (pH 4.6) / CH$_3$CN = 75 / 25
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- 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$_2$PO$_4$ (pH 6.0) / CH$_3$CN = 90 / 10
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm
Antipsychotic Drug

Thioridazine

Column: ULTRON ES-CD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 75 / 25
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Hypnotics

Hexobarbital

Column: ULTRON ES-CD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 6.0) / CH₃CN = 99 / 1
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Bronchodilators

Clorrenaline

Column: ULTRON ES-CD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 94 / 6
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Terbutaline

Column: ULTRON ES-CD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 6.0) / CH₃CN = 99 / 1
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm
Diuretics

Ethiazide

Column: ULTRON ES-CD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 92.5 / 7.5
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Benzoin

Column: ULTRON ES-CD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 88 / 12
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Others

Flavanone

Column: ULTRON ES-CD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 80 / 20
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

PTH-Valine

Column: ULTRON ES-CD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 3.0) / CH₃CN
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm
-Blockers

**Alprenolol**
- Column: ULTRON ES-PhCD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 80 / 20
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Arotinolol**
- Column: ULTRON ES-PhCD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 75 / 25
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Atenolol**
- Column: ULTRON ES-PhCD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 6.0) / CH₃CN = 90 / 10
- Flow Rate: 0.6 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm

**Bunitrolol**
- Column: ULTRON ES-PhCD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 70 / 30
- Flow Rate: 1.2 mL/min
- Temperature: 25 °C
- Detection: UV-220 nm
Pindolol

Column: ULTRON ES-PhCD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 4.6) / CH$_3$CN = 90 / 10
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Propranolol

Column: ULTRON ES-PhCD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 4.6) / CH$_3$CN = 60 / 40
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Bupivacaine

Column: ULTRON ES-PhCD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 4.6) / CH$_3$CN = 80 / 20
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm

Acetylpheneturide

Column: ULTRON ES-PhCD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH$_2$PO$_4$ (pH 4.6) / CH$_3$CN = 76 / 24
Flow Rate: 1.2 mL/min
Temperature: 25 °C
Detection: UV-220 nm
Skeletal Muscle Relaxants

**Chlorphenesin**
- Column: ULTRON ES-PhCD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 70 / 30
- Flow Rate: 0.6 mL/min
- Temperature: 9 °C
- Detection: UV-220 nm

**Chlormezanone**
- Column: ULTRON ES-PhCD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 70 / 30
- Flow Rate: 0.6 mL/min
- Temperature: 9 °C
- Detection: UV-220 nm

**Eperisone**
- Column: ULTRON ES-PhCD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 70 / 30
- Flow Rate: 1.2 mL/min
- Temperature: 9 °C
- Detection: UV-220 nm

**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 °C
- Detection: UV-254 nm
N-(3,5-Dinitrobenzoyl)-m-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 °C
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 °C
Detection: UV-254 nm

-Phenylethyl Alcohol

Column: ULTRON ES-PhCD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 90 / 10
Flow Rate: 0.6 mL/min
Temperature: 15 °C
Detection: UV-220 nm

-Phenylethylamine

Column: ULTRON ES-PhCD
Size: 150 mm x 6.0 mm I.D.
Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 95 / 5
Flow Rate: 0.6 mL/min
Temperature: 15 °C
Detection: UV-220 nm
The Relationship Between Flow Ratio and Capacitor Ratio ($k'$) of Column Temperature, Optics Recognition Ability ($\theta$)  

**$\alpha$-Phenylethylamine**

- Column: ULTRON ES-PhCD
- Size: 150 mm x 6.0 mm I.D.
- Mobile Phase: 20 mM KH₂PO₄ (pH 4.6) / CH₃CN = 90 / 10
- Detection: UV-220 nm

**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 °C
- Detection: UV-254 nm
Elution Position of The Aliphatic Organic Acid

- Column: ULTRON PS-80H
- Size: 300 mm x 8.0 mm I.D.
- Mobile Phase: HClO₄aq. (pH2.1)
- Flow Rate: 1.0 mL/min
- Temperature: 60 ℃
- Detection: UV-210 nm

Elution Position of The Aromatic Organic Acid

- Column: ULTRON PS-80H
- Size: 300 mm x 8.0 mm I.D.
- Mobile Phase: 10 % CH₃CN Addition HClO₄aq. (pH2.1)
- Flow Rate: 1.0 mL/min
- Temperature: 60 ℃
- Detection: UV-210 nm
Alcohols Aldehydes

- Formaldehyde
- Acetaldehyde
- Ethanol

Column: ULTRON PS-80H
Size: 300 mm x 8.0 mm I.D. + 50 mm x 8.0 mm I.D.
Mobile Phase: HClO₄aq (pH 2.1)
Flow Rate: 1.0 mL/min
Temperature: 60 °C
Pressure: 25 kgf/cm²
Detection: RI, 32x10⁻⁶ RIUFS

Alcohols

- Ethylene Glycol
- Diethylene Glycol
- Methanol
- Ethanol
- Isopropyl Alcohol

Column: ULTRON PS-80H
Size: 300 mm x 8.0 mm I.D.
Mobile Phase: H₂O
Flow Rate: 1.0 mL/min
Temperature: 60 °C
Pressure: 25 kgf/cm²
Detection: RI, 32x10⁻⁶ RIUFS
Inj. Vol.: 6.0 μL (10 mg/mL)

Uronic Acid, Acetylation Amino Sugar

- Glucuronic Acid
- N-Acetylgalactosamine
- N-Acetylgalactosamine

Column: ULTRON PS-80H
Size: 300 mm x 8.0 mm I.D. + 50 mm x 8.0 mm I.D.
Mobile Phase: HClO₄aq (pH 2.1)
Flow Rate: 1.0 mL/min
Temperature: 60 °C
Pressure: 25 kgf/cm²
Detection: UV-210 nm

Analysis of The Soy Sauce

- Citric Acid
- Tartaric Acid
- Malic Acid
- Succinic Acid
- Lactic Acid
- Acetic Acid
- Pyroglutamic Acid

Column: ULTRON PS-80H
Size: 300 mm x 8.0 mm I.D.
Mobile Phase: HClO₄aq (pH 2.1)
Flow Rate: 1.0 mL/min
Temperature: 60 °C
Pressure: 25 kgf/cm²
Detection: UV-210 nm
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: HClO₄aq (pH 2.1)
Flow Rate: 0.05 mL/min
Temperature: 60 °C
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 °C
Detection: ESI Positive and Negative, Range: m/z 50–350
Elution Position of Sugar and Sugar Alcohol for PS-80N

- Column: ULTRON PS-80N
- Size: 300 mm x 8.0 mm I.D.
- Mobile Phase: H₂O
- Flow Rate: 1.0 mL/min
- Temperature: 60 °C
- Detection: RI, 16x10⁻⁵ RIUFS
- Sample: ea. 15 mg/mL, Ethanol 50 µL/mL

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

- Column: ULTRON PS-80C
- Size: 300 mm x 8.0 mm I.D.
- Mobile Phase: H₂O
- Flow Rate: 1.0 mL/min
- Temperature: 80 °C
- Detection: RI, 16x10⁻⁵ RIUFS
- Sample: ea. 10 µL/mL

- Dextran T-10
- Raffinose
- Lactose
- Glucose
- Galactose
- Arabinose
- Ethanol

- Dextran T-10
- Raffinose
- Sucrose
- Glucose
- Galactose
- Fructose
- Adonitol
- Glycerol
- Ethanol + Mannitol
- Xylitol + Sorbitol
Elution Position of Sugar and Sugar Alcohol for PS-80P

Column: ULTRON PS-80P
Size: 300 mm x 8.0 mm I.D.
Mobile Phase: H₂O
Flow Rate: 1.0 mL/min
Temperature: 80 °C
Detection: RI, 16x10⁻⁵ RIUFS
Sample: ea. 10 µL/mL

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$_2$O
- **Flow Rate**: 1.0 mL/min
- **Temperature**: 80 $^\circ$C
- **Pressure**: 20 kgf/cm$^2$
- **Detection**: RI, 16x10$^{-5}$ RIUFS

- Sucrose
- Lactose
- Glucose
- Xylosel
- Galactose
- Fructose
- Inositol

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$_2$O
- **Flow Rate**: 1.0 mL/min
- **Pressure**: 20 kgf/cm$^2$
- **Detection**: RI, 16x10$^{-5}$ RIUFS

- Dextran T-10
- Maltotriose
- Maltose
- Glucose
- Galactose
- Inositol
- Ethanol

- **Column**: ULTRON PS-80N-L
- **Size**: 500 mm x 8.0 mm I.D.
- **Mobile Phase**: H$_2$O
- **Flow Rate**: 1.0 mL/min
- **Pressure**: 35 kgf/cm$^2$
Sake

Column: ULTRON PS-80N
Size: 300 mm x 8.0 mm I.D.
Mobile Phase: H₂O
Flow Rate: 1.0 mL/min
Temperature: 60 °C
Pressure: 22 kgf/cm²
Detection: RI, 16x10⁻⁵ RIUFS
Injection Vol.: 10 μL

Starch Syrup

Column: ULTRON PS-80N
Size: 300 mm x 8.0 mm I.D.
Mobile Phase: H₂O
Flow Rate: 1.0 mL/min
Temperature: 60 °C
Pressure: 22 kgf/cm²
Detection: RI, 16x10⁻⁵ RIUFS
Injection Vol.: 5 μL (25 mg/mL)

Separation of Stachyose and Raffinose

Column: ULTRON PS-80N
Size: 300 mm x 8.0 mm I.D.
Mobile Phase: H₂O
Flow Rate: 1.0 mL/min
Temperature: 60 °C
Pressure: 25 kgf/cm²
Detection: RI, 128x10⁻⁶ RIUFS
Injection Vol.: 10 μL (2 mg/mL)

Yoghurt Drink

Column: ULTRON PS-80C
Size: 300 mm x 8.0 mm I.D.
Mobile Phase: H₂O
Flow Rate: 0.5 mL/min
Temperature: 80 °C
Pressure: 20 kgf/cm²
Detection: RI, 8x10⁻⁵ RIUFS
Injection Vol.: 10 μL
Inositol in Health Drink

Health Drink R

Health Drink RS

Column: ULTRON CI
Size: 200 mm x 4.6 mm I.D.
Mobile Phase: CH₃CN / H₂O = 60 / 40
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: RI

Glucuronic Acid in Health Drink

L-sodium Glutamate, Glucuronic Acid

Health Drink C

Column: ULTRON CL
Size: 150 mm x 4.0 mm I.D.
Mobile Phase: N.,)¹
Flow Rate: 0.8 mL/min
Temperature: 70 °C
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**

- Pyridine
- Phenol

**Acidic Compounds**

- p-Hydroxybenzoic Acid
- m-Hydroxybenzoic Acid
- Phenol
- Acetylsalicylic Acid
- Benzoic Acid
- Salicylic Acid

**Separation of The Steroid**

- Prednisone
- Cortisone
- Hydrocortisone
- Cortisone Acetate
- Hydrocortisone Acetate

**The Water-soluble Vitamin**

- Nicotinic Acid
- Nicotinic Acid Amide
- Calcium Pantothenate
- Pyridoxine Hydrochloride
- Riboflavin Phosphate
- Thiamine
- Folic Acid
- Biotin
- Riboflavin

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Column: ULTRON VX-ODS
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: CH₃CN / H₂O = 30 / 70
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV-254 nm

Column: ULTRON VX-ODS
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 10 mM (NH₄)₃PO₄ (pH 2.5) / CH₃CN = 80 / 20
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV-254 nm

Column: ULTRON VX-ODS
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: H₂O / CH₃OH / THF = 70 / 10 / 20
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-254 nm

Column: ULTRON VX-ODS
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 20 mM H₃PO₄ / 5 mM CH₃(CH₂)₅SO₃Na = 91 / 9
Flow Rate: 1.0 mL/min
Temperature: 45 °C
Detection: UV-210 nm
The Synthetic Antibacterial Medicine Simultaneity Analysis

Column: ULTRON VX-ODS 5 µm
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: A 10 mM TFA
  B CH₃CN
Flow Rate: 1.0 mL/min
Temperature: 40 ºC

Detected Compounds:
- Amprolium
- Sulfamerazine
- Sulfadimidine
- Thiamphenicol
- Furazolidone
- Oxytetracycline
- Sulfamonomethoxine
- Oxolinic Acid
- Sulfadimethoxine
- Sulfaquinoxaline

Synthetic Antibacterial Medicine Repeat Test

Column: ULTRON VX-ODS 5 µm
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: A 10 mM TFA
  B CH₃CN
Flow Rate: 1.0 mL/min
Temperature: 40 ºC
Detection: UV-254 nm
Chromatogram of The Repeat Test

- Amprolium
- Sulfamerazine
- Sulfadimidine
- Thiophenicol
- furazolidone
- Oxytetracycline
- Sulfamonomethoxine
- Oxolinic Acid
- Sulfadimethoxine
- Sulfadimethoxine
- Sulfaquinoxaline

Column: ULTRON VX-ODS 5 µm
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: A 10 mM TFA
B CH₃CN
Flow Rate: 1.0 mL/min
Temperature: 40
Detection: UV-254 nm

Naphthalene

Pyridine, Phenol Test

Naphthalene

Pyridine
Phenol

Column: ULTRON VX-ODS
Size: 150 mm x 2.1 mm I.D.
Mobile Phase: CH₃CN/H₂O=70/30
Flow Rate: 0.2 mL/min
Temperature: Ambient
Detection: UV-254nm,0.16AUFS
Pressure: 66 MPa

Column: ULTRON VX-ODS
Size: 150 mm x 2.1 mm I.D.
Mobile Phase: CH₃CN/H₂O=30/70
Flow Rate: 0.2 mL/min
Temperature: Ambient
Detection: UV-254nm,0.16AUFS
Pressure: 44 MPa
Life Test in Acidic Solution

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

Mobile Phase: 60% Methanol, 0.1% TFA (pH 2.2)

Comparison of Alkylbenzene in VX-Octyl and VX-ODS

Column: ULTRON VX-Octyl 5 µm
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: CH₃OH/H₂O
Flow Rate: 1.0 mL/min
Temperature: 40°C
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 (pH 2.1)
0.2 M NaClO4
Flow Rate: 1.0 mL/min
Temperature: 50 °C
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 KH2PO4 (pH 5.8)
0.2 mM Na2SO4
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 NH4H2PO4 (pH 2.6)
Flow Rate: 1.0 mL/min
Temperature: 40 °C
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(pH 4)
17% CH3OH 1-Octane Sodium Sulphonate
160mg/L EDTA 5mg/L
Flow Rate: 1.0 mL/min
Temperature: 25 °C
Detection: ECD, 800 mV, 10 nA
### Bile Acid
- Cholic Acid
- Glucocholic Acid
- Taurocholic Acid
- Chenodeoxycholic Acid
- Glucchenodeoxycholic Acid
- Deoxycholic Acid
- Taurochenodeoxycholic Acid
- Taurodeoxycholic Acid

**Column:** STR ODS-
**Size:** 150 mm x 4.6 mm I.D.
**Mobile Phase:** CH3CN/30 mM (NH4)2HPO4 (pH 7.2 NH4H2PO4) A = 10/90, B = 50/50
- 30 % B
- 85 % B (55 min)
**Flow Rate:** 1.0 mL/min
**Temperature:** 40 °C
**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) CH3CN -Cyclodextrin
- 8 mM
- 10 mM
**Flow Rate:** 1.0 mL/min
**Temperature:** 50 °C
**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) / CH3CN (93:7)
- B: CH3CN / H2O (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 °C
**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
CH3CN
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-210 nm (0.16 AUFS)

The 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 % CH3CN
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-280 nm (0.08 AUFS)

The Freshness K Value

- Hypoxanthine
- Inosine 5'-Monophosphate
- Adenosine 5'-Phosphate
- 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 °C
Detection: UV-250 nm (0.04 AUFS)
**Organic Acids**

- Tartaric Acid
- Malic Acid
- Malonic Acid
- Acetic Acid
- Propionic Acid

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

- Saccharin
- Aspartame
- Benzoic Acid
- Sorbic Acid

**The Phenolic System Antioxidant**

(It is added to the edible oil of the marketing.)

- Prostaglandin
- 2,4,5-Trihydroxybutyrophenone
- Nordihydroguaiaretic Acid
- Butyl Hydroxy Anisol
- Octyl Gallate
- 2,6-Di-t-butyl-4-hydroxy-methylphenol
- Lauryl Gallate
- 2,6-Di-t-butylhydroxytoluene

**Paraben**

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

- Methyl Paraben
- Ethyl Paraben
- Isopropyl Paraben
- Propyl Paraben
- Isobutyl Paraben
- Butyl Paraben

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Column: STR ODS-
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 5 mM NH₄H₂PO₄ (pH 2.4)
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-210 nm (0.08 AUFS)

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

Column: STR ODS-
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: A: 10 mM-Phosphate Buffer (pH2.6) B: CH₃CN
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: SPD-10A, 270 nm 2AU/V, AT = 6

Column: STR ODS-
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 10 mM-Phosphate Buffer (pH2.6)
Flow Rate: 1.5 mL/min
Temperature: 40 °C
Detection: SPD-10A, 280 nm 2AU/V, AT = 7
The Component of The Anti-inflammatory Agent

- Salicylic Acid
- Diphenhydramine
- Methyl Salicylate
- -Camphor
- Thymol

Anticonvulsant Analysis

- Ethosuximide
- Primidone
- Phenobarbital
- Phenytion
- Carbamazepine

The Component of The Cold Remedy

- Methylephedrine Hydrochloride
- Noscapine
- Thiamine
- Dextromethorphan
- Carbinoxamine Maleate

The Component of The Cold Remedy

- Acetaminophen
- Caffeine
- Riboflavin
- Phenol
- Potassium Guaiacol-4-sulfonate
Oxine Copper

Column: STR ODS-
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 50 mM-Phosphate Buffer (pH 2.2) 95
         CH₃CN 5
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-240 nm (0.04 AUFS)

Thiuram

Column: STR ODS-
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: CH₃CN 50
         H₂O 50
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-280 nm (0.01 AUFS)

Asulam

Column: STR ODS-
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 50 mM-Phosphate Buffer (pH 3.3) 90
         CH₃CN 10
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-270 nm (0.01 AUFS)

Iprodione, Bensulide

Column: STR ODS-
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: CH₃CN 60
         H₂O 40
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-230 nm (0.02 AUFS)
Arbutin in The Bearberry Leaf End

- Column: STR ODS-
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 100 mM-Phosphate Buffer (pH 2.1) 40 mM CH₃OH 1
- Flow Rate: 0.9 mL/min
- Temperature: 35 °C
- Detection: UV-280 nm (0.16 AUFS)

Berberine in The Coptis End

- Column: STR ODS-
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: The Result of Dissolving Potassium Dihydrogenphosphate 3.4g and Sodium Lauryl Sulfate 1.7g at Water 1L/CH₃CN=1 / 1
- Flow Rate: 0.5 mL/min
- Temperature: 40 °C
- Detection: UV-345 nm (0.16 AUFS)

Glycyrrhizin in The Licorice End

- Column: STR ODS-
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 15 Times Dilution Acetic Acid Aqueous Solution 3 CH₃CN 2
- Flow Rate: 0.7 mL/min
- Temperature: Ambient
- Detection: UV-254 nm (0.08 AUFS)

Paeoniflorin in The Peony End

- Column: STR ODS-
- Size: 150 mm x 4.6 mm I.D.
- Mobile Phase: 10 mM Sodium Acetate (pH 4.8) 5 CH₃CN 1
- Flow Rate: 0.5 mL/min
- Temperature: 40 °C
- Detection: UV-230 nm (0.64 AUFS)
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 °C
- 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/CH3CN=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
- Gtymine
- Uridine
- Adenosine 5'-Monophosphate
- Inosine
- Guanosine

AMP, ADP, ATP

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

The Freshness K Value

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

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: 30 mM 2-Diethylaminoethanol is contained
20 mM Citric Acid Aqueous Solution
Flow Rate: 0.8 mL/min
Temperature: 40 °C
Detection: UV-260 nm

Column: STR ODS-M
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: 0.1 M KH₂PO₄, 20 mM Na₂SO₄ (pH 5.8)
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV-254 nm

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
CH₃CN 1
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Detection: UV-210 nm
**Organic Acids**

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

**Caffeine and Catechin**

- Epigallocatechin
- Catechin
- Caffeine
- Epigallocatechin Gallate
- Epicatechin
- Epicatechin Gallate

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

- Saccharin
- Aspartame
- Benzoic Acid
- Sorbic Acid

**Anticonvulsant Analysis**

- Ethosuximide
- Primidone
- Phenobarbital
- Phenytone
- Carbamazepine
Nicarbazin

Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 10 mM-Phosphate Buffer (pH 2.6)  
CH₃CN  
Flow Rate: 0.8 mL/min  
Temperature: 40 °C  
Detection: UV-340 nm

Ethopabate

Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: H₂O  
CH₃CN  
Flow Rate: 0.7 mL/min  
Temperature: 40 °C  
Detection: UV-270 nm

Berberine

Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: The Result of Dissolving Potassium Dihydrogenphosphate 3.4g and Sodium Lauryl Sulfate 1.7g at Water 1L / CH₃CN=1 / 1  
Flow Rate: 0.6 mL/min  
Temperature: 40 °C  
Detection: UV-345 nm

Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 10 mM-Phosphate Buffer (pH 2.6)  
CH₃CN  
Flow Rate: 1.0 mL/min  
Temperature: 40 °C  
Detection: UV-345 nm
Scopolamine, Hyoscyamine

- Scopolamine
- 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 / CH₃CN = 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) 200 mM NaClO₄ CH₃CN
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: H₂O / CH₃OH / 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) / CH₃OH = 40 / 1
Flow Rate: 0.8 mL/min
Temperature: 40
Detection: UV-280 nm
Aldehydes (1,3-Cyclohexanedione Derivatives)

Column: STR ODS-M
Size: 150 mm x 4.6 mm I.D.
Mobile Phase: CH₃CN / H₂O = 35 / 65
Flow Rate: 0.8 mL/min
Temperature: 40 °C
Detection: RF-535  Ex = 360 nm  Em = 440 nm
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