

领先的色谱柱、填料、树脂、层析设备、分析液相专业供应商

慧德易科技

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High quality & Expert

2012年第四十九期

新Develosil C30专题



## 新 Develosil C30 专题

### 一、简介

Develosil C30 是野村化学的专利色谱柱，近年来相继开发出了各具特色的 C30 柱，如：

- 通用型 Develosil C30-UG
- 亲水型 Develosil RPAQUEOUS
- 耐酸型 Develosil RPAQUEOUS-AR
- 专为高流速设计 Develosil Combi-RP（适用于组合化学中药物分析）

宽 pH 范围及可以快速平衡 Develosil XG-30M。

相对于 C18，C30 拥有更长的烷基链，通过增加固定相的疏水性，增加极性与非极性物质的保留时间，故 Develosil C30 既适于极性物质如糖、核酸等的分离，也适于脂溶性物质如维生素 E、类胡萝卜素等的分离。

Develosil C30 系列产品的参数：

产品	粒径 (μm)	孔径 (Å)	碳含量 (%)	封端	键合方式	pH
C30-UG	3, 5	140	18	是	单聚	2-8
RPAQUEOUS	5	140	18	是	单聚	3-8
RPAQUEOUS-AR	3, 5	140	18	是	单聚	1-7
Combi-RP	3, 5	140	18	是	单聚	2-8
XG-30M	3, 5	140	19	否	单聚	1.5-8

注：单聚 C30 相对于多聚 C30，其表现出更好的柱效、峰型。

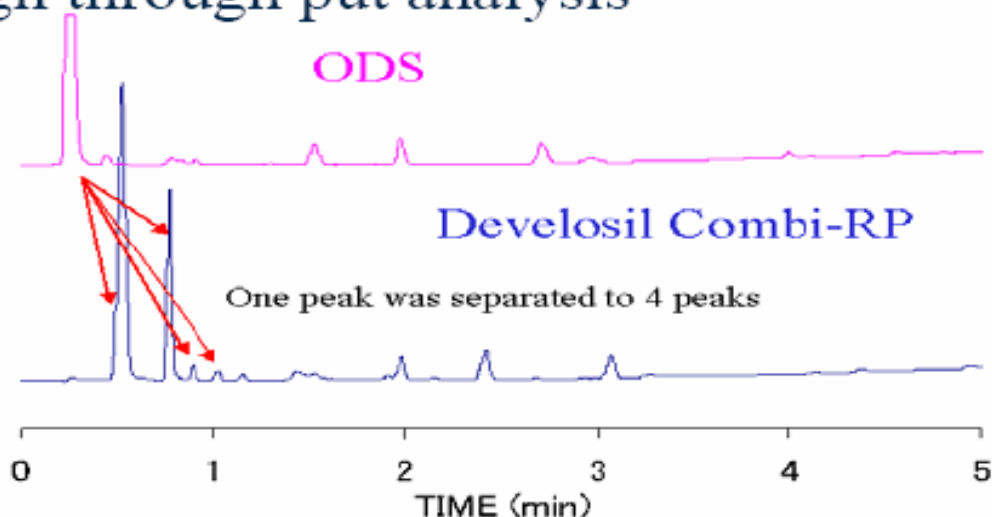
### 二、选择 C30 的 12 个理由

- 1, 在酸性条件下 (pH2) 优异的柱床稳定性和持久性 (可达 500 小时)
- 2, 非常高的氢键容量意味着对于极性很强的化合物 (如核酸) 比一般的极性封端或者其他高效 C18 柱有着更长的保留。
- 3, 在碱性条件下极长的柱寿命 (可达 250 小时)。
- 4, 对于酸性物质的分离十分合适。
- 5, 因为 RP-Aqueous C-30 是通常的 TMS (C1) 封端，它不包含极性基团或封端，也就不会影响质谱工作。另外，极度疏水的 C30 固定相允许您使用非常高的有机相比例，利于减小您在分析中的质谱噪声。

- 6, 分离极性化合物有着非常好的峰型。
- 7, 独特的专利 C30 键合相提供了一种非同寻常的选择性。
- 8, 可以在 100% 水溶液流动相下分离糖。
- 9, 低配体密度键合和封端技术使得 C30 色谱柱有着突破性的重现能力。其可以用于 100% 水溶液流动相, 也可以用于 100% 有机相。
- 10, 对于中性和疏水性化合物, C30 色谱柱的保留特性与普通 C18 色谱柱类似。对于其他化合物, 我们可以看到非同寻常的选择性, 这使得 RP-Aqueous 色谱柱非常适合于快速分析。
- 11, RP-Aqueous 的超纯硅胶和长寿命, 极端稳定的 C30 硅烷键合相意味着您可以在很高的温度下 (比如 60°C) 使用 RP-Aqueous 色谱柱而不用担心损坏色谱柱!
- 12, 可以分离  $\alpha$ - $\beta$ - $\gamma$  - 和  $\delta$  - 维生素 E, 这对于一般的 C18 色谱柱而言很困难。

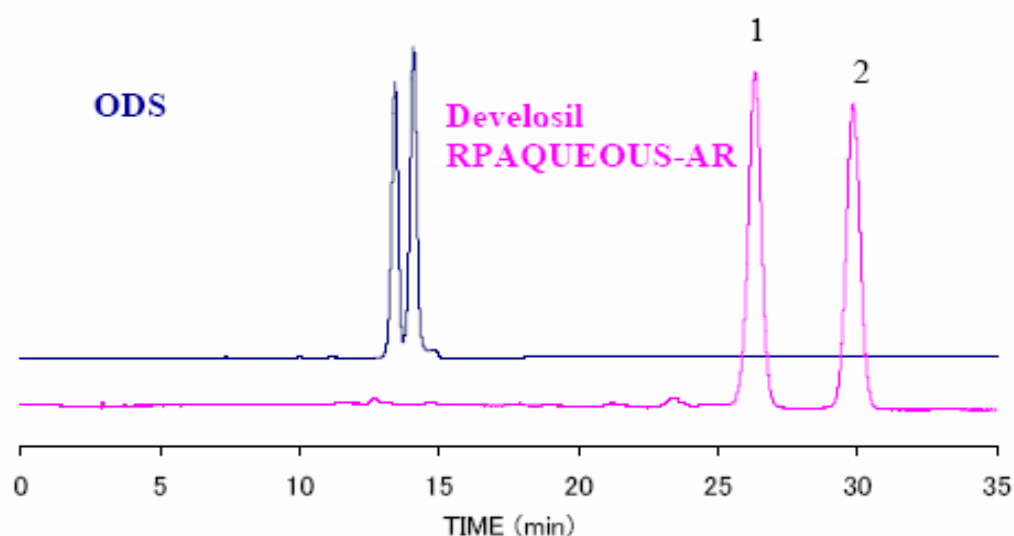
### 三、应用

#### High through put analysis



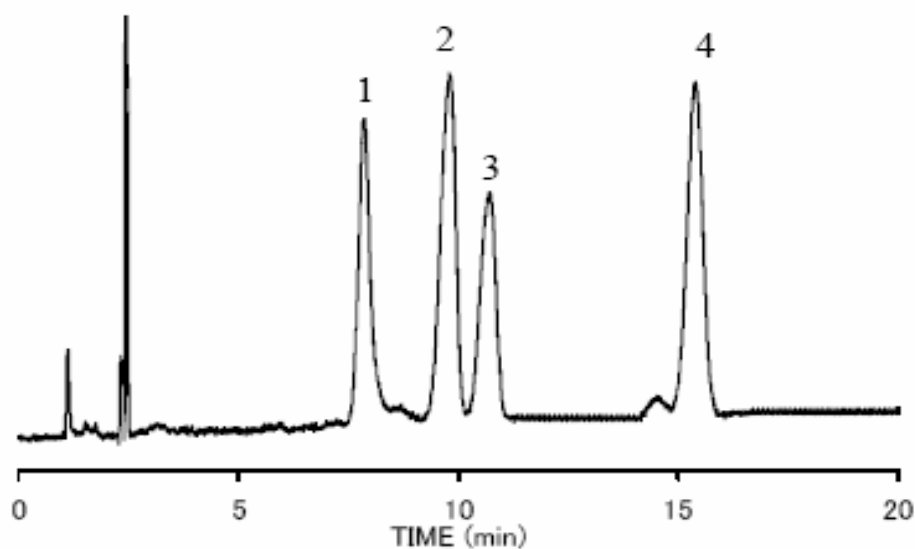
Column: **Develosil Combi-RP-5** 50 x 4.6 mm, ODS 50 x 4.6 mm  
 Mobile phase: A) 0.1% TFA in water, B) Acetonitrile  
 Combi-RP: %B 0 to 100% in 5min  
 ODS: %B 10% to 100% in 5 min  
 Flow rate: 3.0 mL/min  
 Temperature: 30 °C  
 Detection: UV@254nm  
 Sample: drink

## Alpha-Carotene and Beta-Carotene



Column: **Develosil RPAQUEOUS-AR-5** 250 x 4.6 mm, ODS 250 x 4.6mm  
 Mobile phase: acetonitrile/chloroform (8:2)  
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: UV@450nm  
 Sample: 1. Alpha-carotene, 2. Beta-carotene

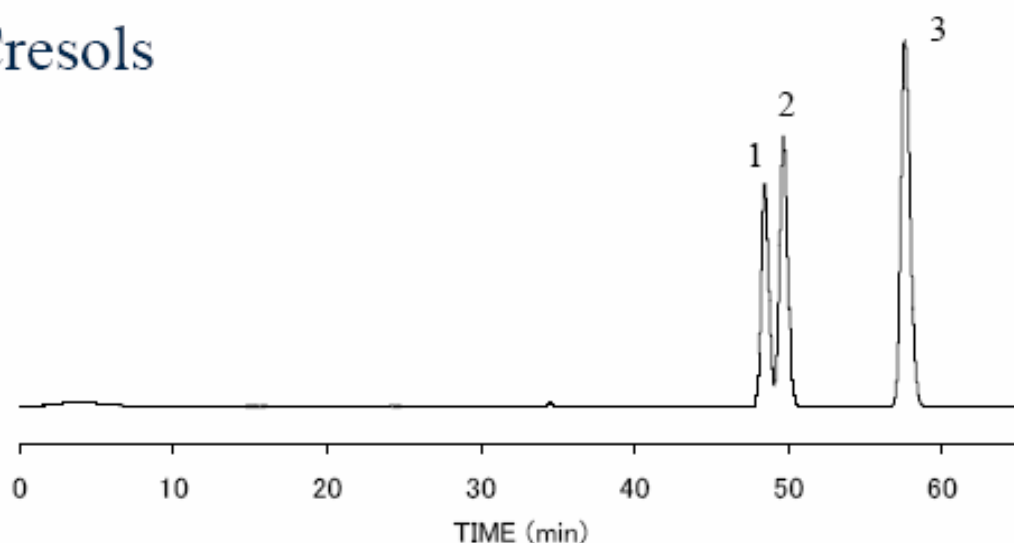
## Carotenoids



Column: **Develosil C30-UG-5** 250 x 4.6 mm  
 Mobile phase: Methanol/acetonitrile(50:50) + 0.05% triethylamine  
 Flow rate: 1.2 mL/min  
 Temperature: 30 °C  
 Detection: VIS@480nm  
 Sample: 1. Astaxanthin, 2. Lutein, 3. Zeaxanthin, 4. Canthaxanthin

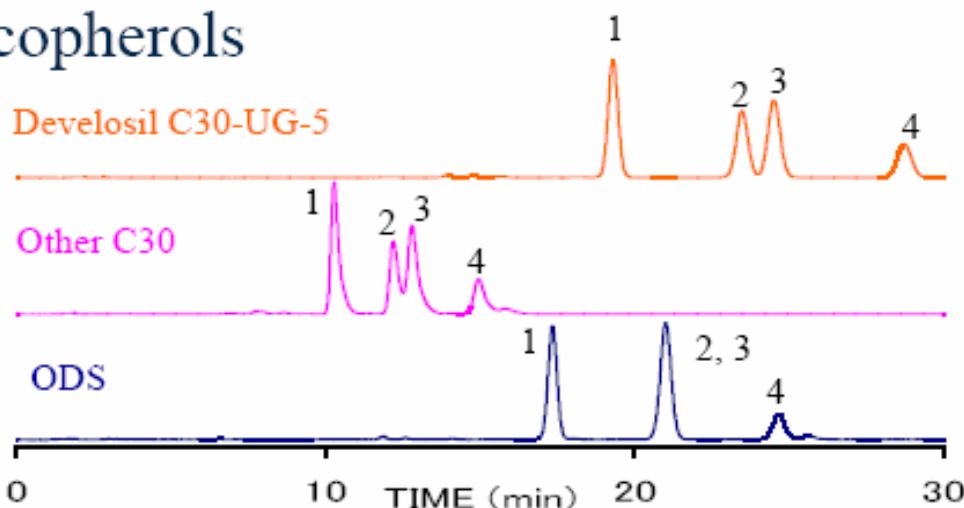


## Cresols



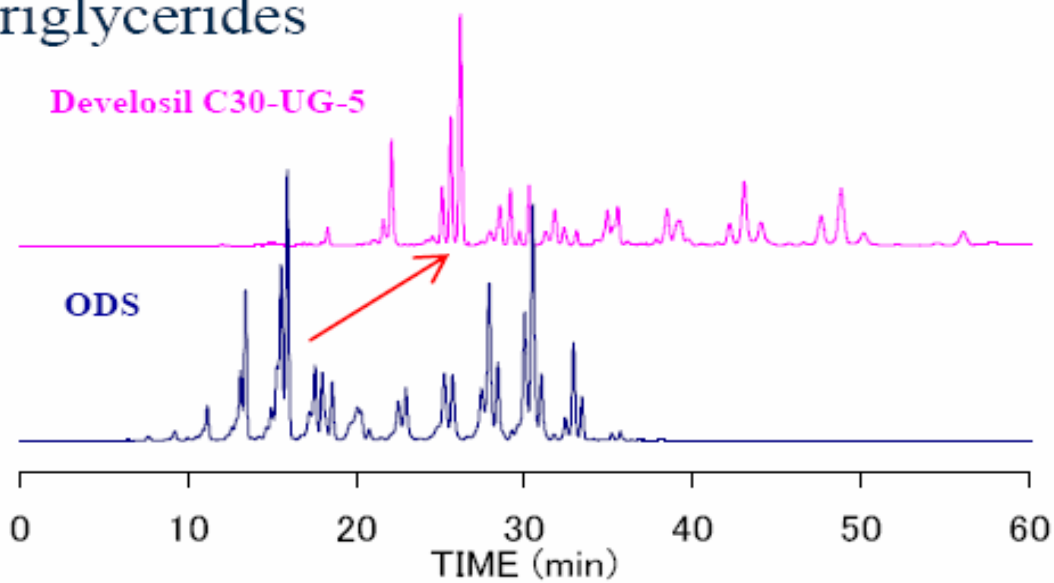
Column: **Develosil C30-UG-5** 250 x 4.6 mm x 2  
 Mobile phase: THF/methanol/water(10:45:45)  
 Flow rate: 0.4 mL/min  
 Pressure: 20MPa  
 Temperature: 15 °C  
 Detection: UV@254nm  
 Sample: 1. p-Cresol, 2. m-Cresol, 3. o-Cresol

## Tocopherols



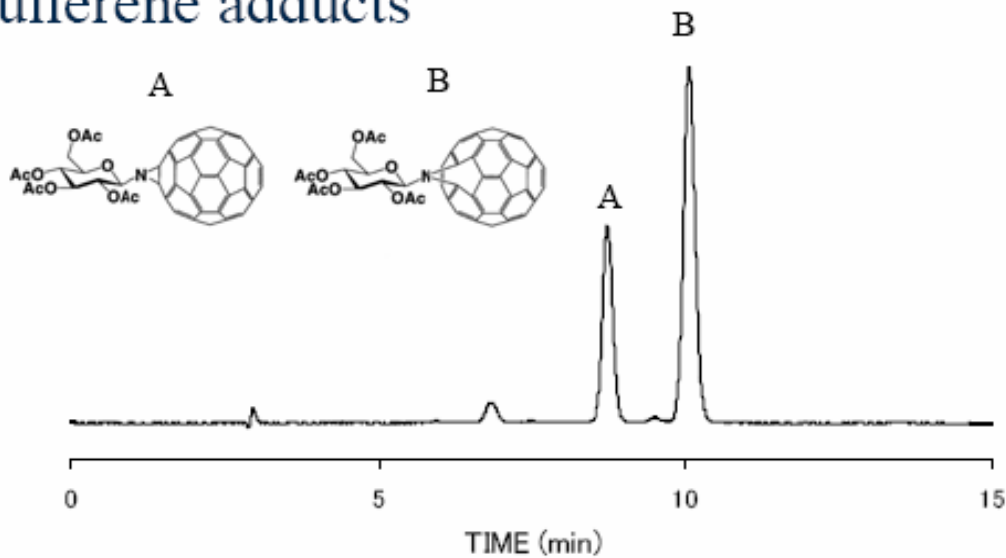
Column: **Develosil C30-UG-5 (RPAQUEOUS)** 250 x 4.6 mm  
 other C30 250 x 4.6 mm, ODS 250 x 4.6 mm  
 Mobile phase: methanol/water(97:3)  
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: UV@295nm  
 Sample volume: 1 μL  
 Sample: Tocopherol, 1. Delta, 2. Gamma, 3. Beta, 4. Alpha

## Triglycerides



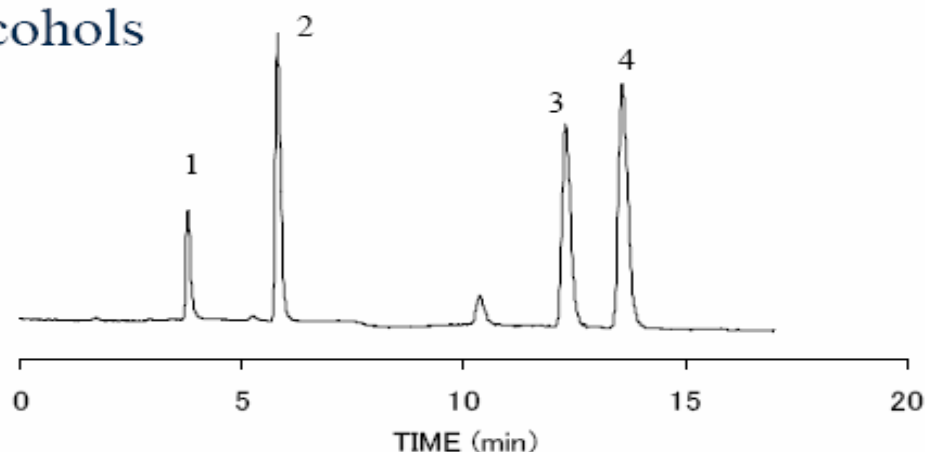
Column: **Develosil C30-UG-5** 250 x 4.6 mm, ODS 250 x 4.6 mm  
 Mobile phase: A) Acetonitrile, B) Acetone  
 %B 30% to 70% in 60 min  
 Flow rate: 1.0 mL/min  
 Temperature: 40 °C  
 Detection: ELSD  
 Sample: Milk

## Fullerene adducts



Column: **Develosil C30-UG-5 (RPFULLERENE)** 250 x 4.6 mm  
 Mobile phase: toluene/acetonitrile (4:6)  
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: UV@335nm  
 Sample: Cycloadduct of Per-o-Acetyl Glycosyl Azides to (60)Fullerene

## Alcohols



Column: **Develosil RPAQUEOUS (C30-UG-5)** 250 x 4.6 mm

Mobile phase: water

Flow rate: 1.0 mL/min

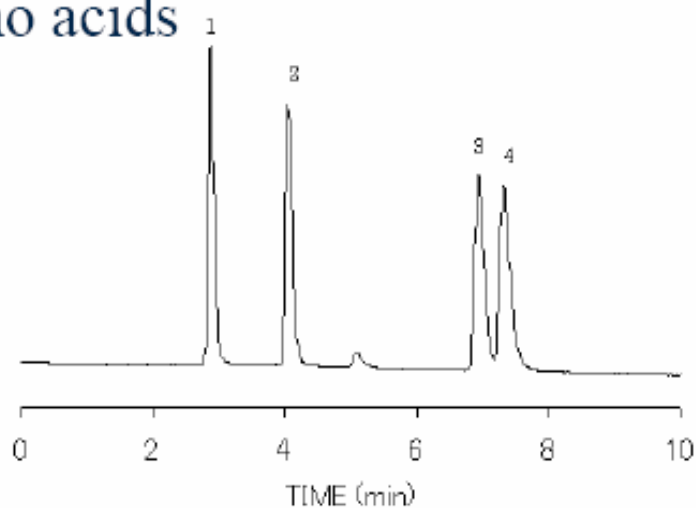
Temperature: 40 °C

Detection: RI

Sample volume: 3  $\mu$ L

Sample: 1. Methanol, 2. Ethanol 1%, 3. 1-Propanol 1%, 4. 2-Propanol 1%

## Amino acids



Column: **Develosil RPAQUEOUS (C30-UG-5)** 250 x 4.6 mm

Mobile phase: water

Flow rate: 1.0 mL/min

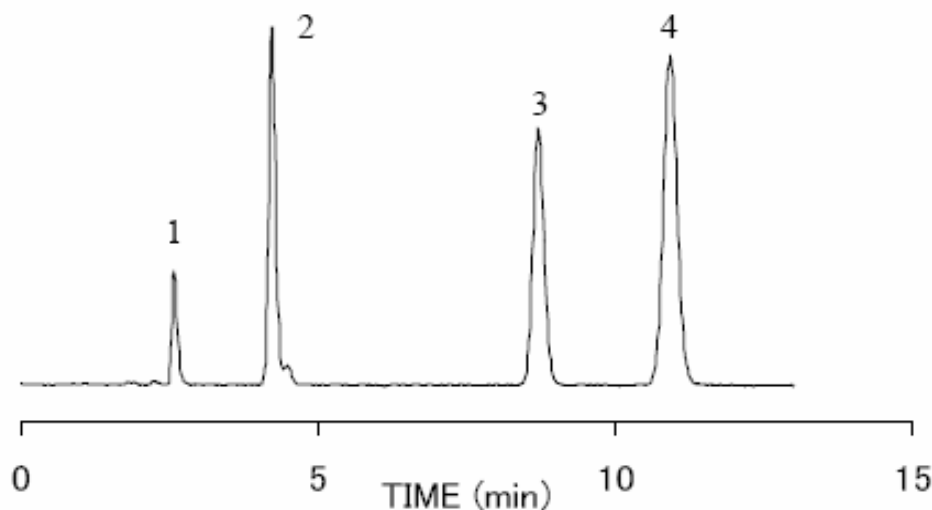
Temperature: 40 °C

Detection: RI

Sample volume: 10  $\mu$ L

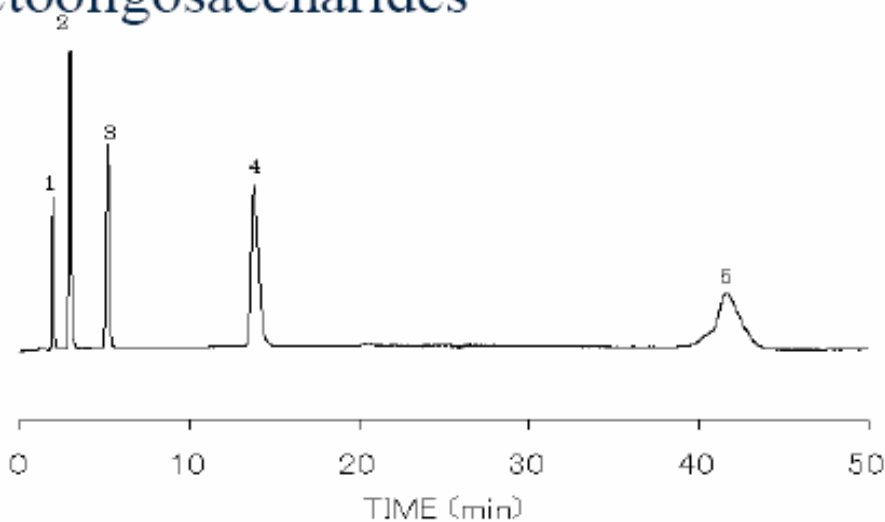
Sample: 1. alanine 0.2%, 2. valine 0.2%, 3. isoleucine 0.2%, 4. leucine 0.2%

## Catecholamines



Column: **Develosil RPAQUEOUS (C30-UG-5)** 150 x 4.6 mm  
 Mobile phase: 0.1M  $\text{KH}_2\text{PO}_4$ , pH2.6 with  $\text{H}_3\text{PO}_4$   
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: UV@210nm  
 Sample: 1. Norepinephrine, 2. Epinephrine, 3. Dopamine, 4. L-DOPA

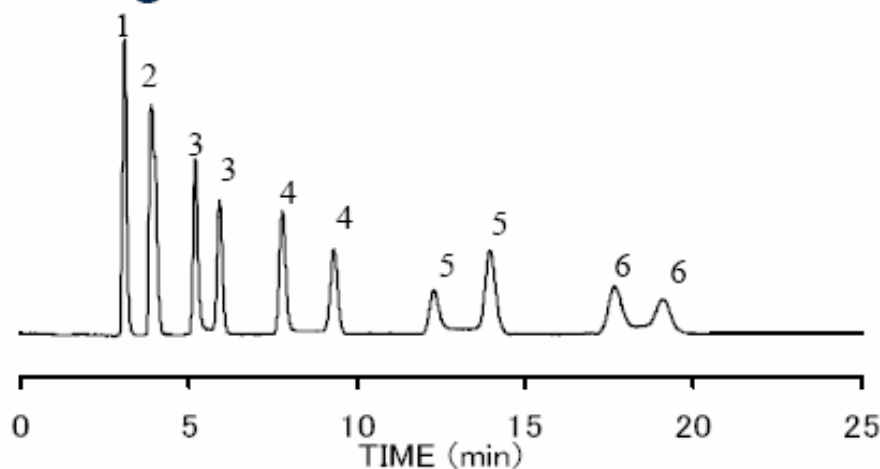
## Fructooligosaccharides



Column: **Develosil RPAQUEOUS (C30-UG-5)** 250 x 4.6 mm  
 Mobile phase: water  
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: RI  
 Sample volume: 10  $\mu\text{L}$   
 Sample: 1. Glucose 0.04%, 2. Saccharose 0.1%, 3. 1-Kestose 0.1%  
 4. nystose 0.2%, 5. 1F-Fructofuranosylnystose 0.4%

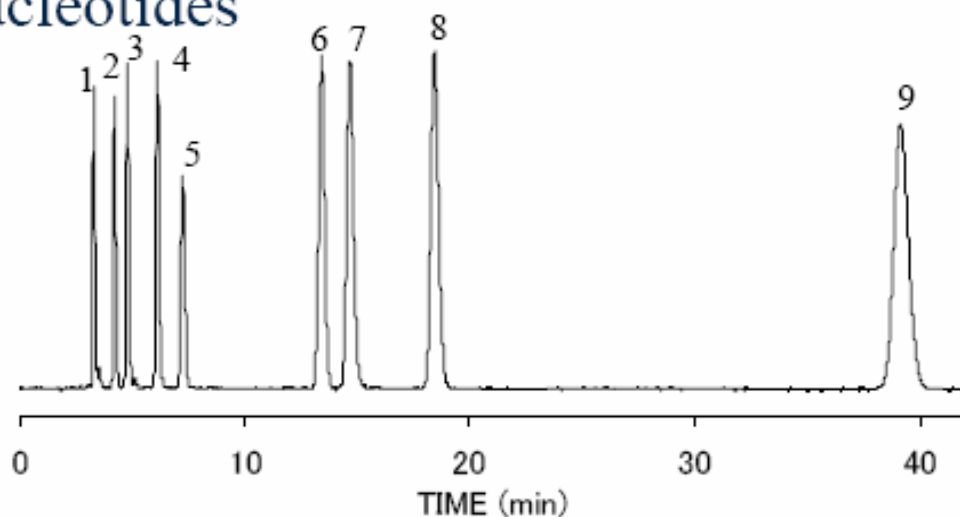


## Maltooligosaccharides



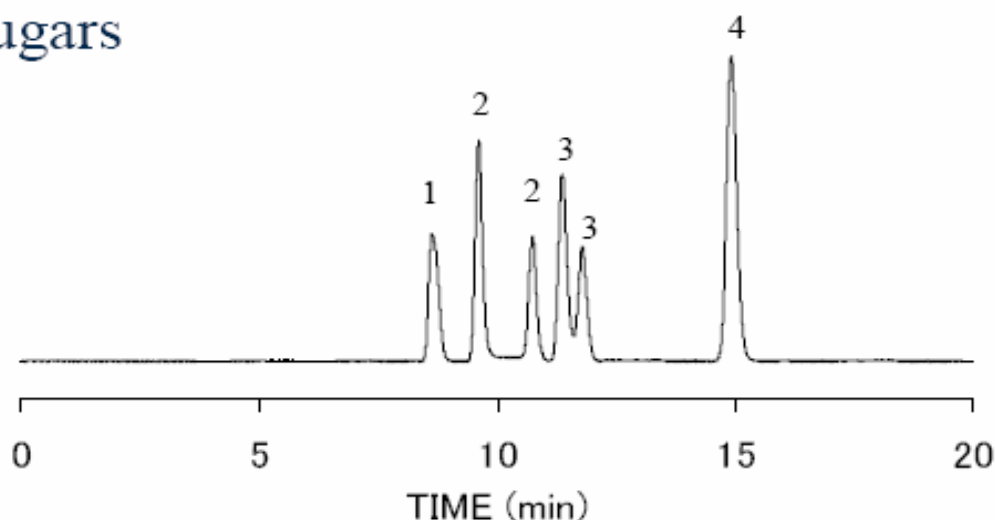
Column: **Develosil RPAQUEOUS (C30-UG-5)** 250 x 4.6 mm  
 Mobile phase: water  
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: RI  
 Sample volume: 20  $\mu$ L  
 Sample: 1. Glucose 0.07% , 2. Maltose 0.1% , 3. Maltotriose 0.1% ,  
 4. Maltotetraose 0.1% , 5. Maltopentaose 0.1% , 6. Maltohexaose 0.1%

## Nucleotides



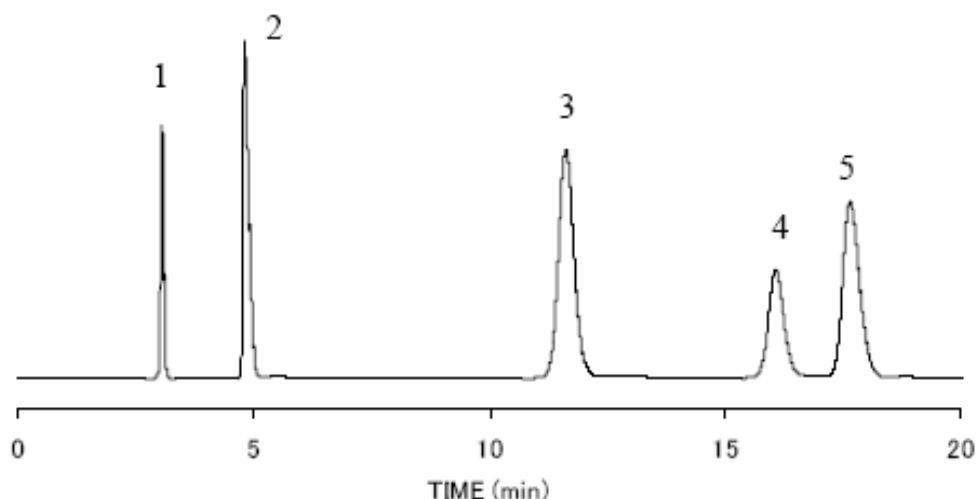
Column: **Develosil RPAQUEOUS (C30-UG-5)** 250 x 4.6 mm  
 Mobile phase: 0.1M  $K_2HPO_4$  with KOH, pH6.0  
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: UV@260nm  
 Sample: 1. 5'-CTP, 2. 5'-CDP, 3. 5'-CMP, 4. 5'-GTP  
 5. 5'-GDP, 6. 5'-GMP, 7. 5'-ATP, 8. 5'-ADP, 9. 5'-AMP

## Sugars



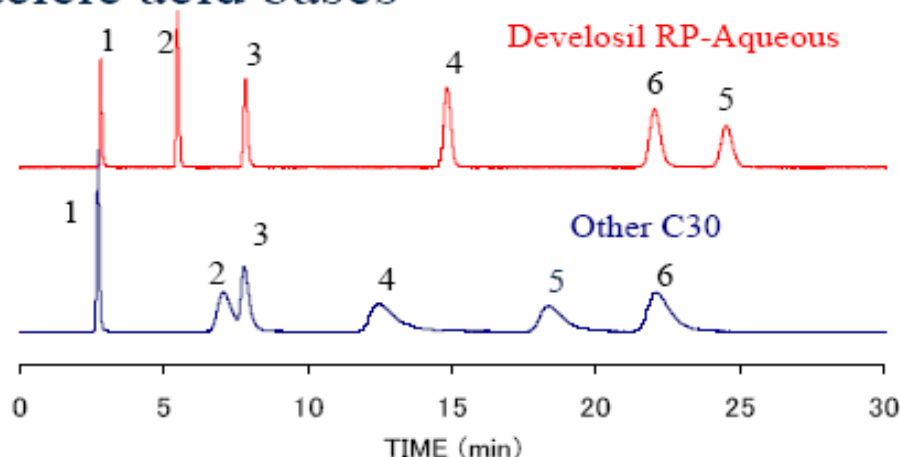
Column: **Develosil RPAQUEOUS (C30-UG-5)** 250 x 4.6 mm + 250 x 4.6 mm  
 Mobile phase: water  
 Flow rate: 0.7 mL/min  
 Temperature: 25 °C  
 Detection: RI  
 Sample volume: 10 ul  
 Sample: 1. Glucose, 2. Lactose, 3. Maltose, 4. Saccharose

## Water-soluble vitamins



Column: **Develosil RPAQUEOUS (C30-UG-5)** 150 x 4.6 mm  
 Mobile phase: 50 mM sodium phosphate (pH6.9)  
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: UV @254 nm  
 Sample: 1. Orotic acid, 2. Nicotinic acid, 3. Pyridoxal HCl, 4. Pyridoxine HCl  
 5. Nicotinamide

## Nucleic acid bases



Column: **Develosil RPAQUEOS (C30-UG-5)** 250 x 4.6 mm  
other C30 250 x 4.6 mm

Mobile phase: 10 mM NaH<sub>2</sub>PO<sub>4</sub> with H<sub>3</sub>PO<sub>4</sub>, pH7.0

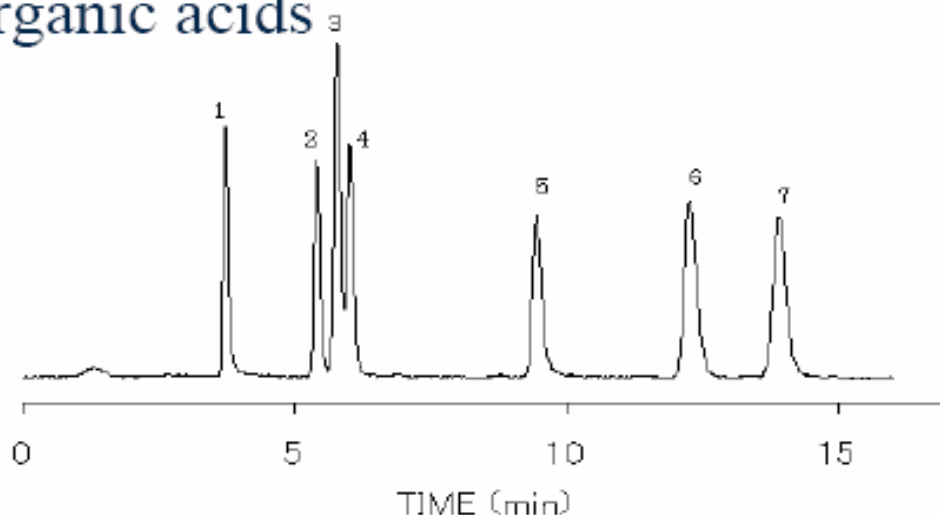
Flow rate: 1.0 mL/min

Temperature: 30 °C

Detection: UV@254nm

Sample: 1. Sodium Nitrite, 2. Cytosine, 3. Uracil, 4. Cytidine, 5. Uridine  
6. Thymine

## Organic acids



Column: **Develosil RPAQUEOUS (C30-UG-5)** 250 x 4.6 mm

Mobile phase: 0.05M NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> with H<sub>3</sub>PO<sub>4</sub>, pH2.4

Flow rate: 1.0 mL/min

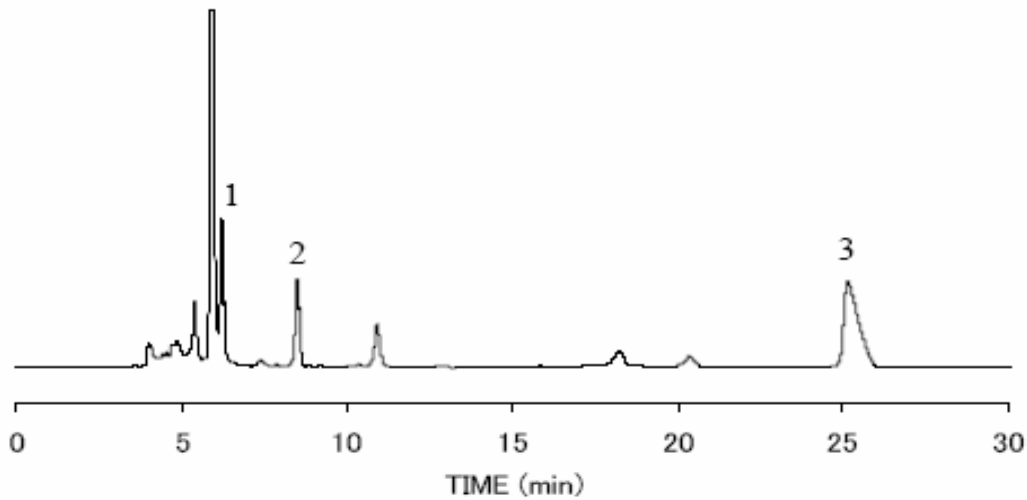
Temperature: 30 °C

Detection: UV@210nm

Sample volume: 2 μL

Sample: 1. Fomic acid, 2. Malonic acid, 3. Lactic acid, 4. Acetic acid  
5. Maleic acid, 6. Citric acid, 7. Fumaric acid

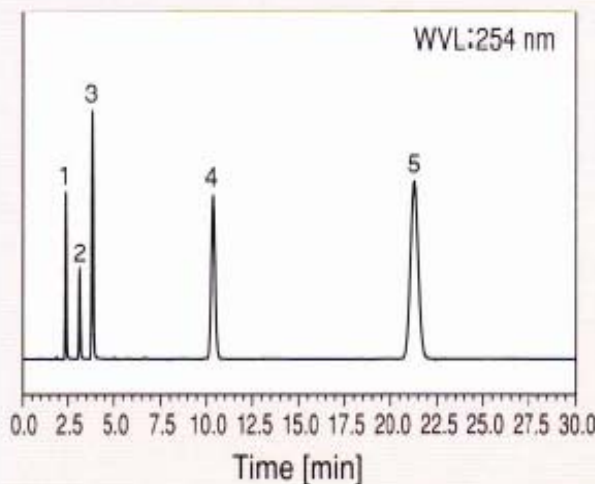
## Organic acids 2



Column: **Develosil RPAQUEOUS-AR-3** 250 x 4.6 mm  
 Mobile phase: 0.1% H<sub>3</sub>PO<sub>4</sub>  
 Flow rate: 0.6 mL/min  
 Temperature: 20 °C  
 Detection: UV@210nm  
 Sample: Organic acids extracted from Kiwi fruit

(1. Quinic acid, 2. Malic acid, 3. Citric acid)

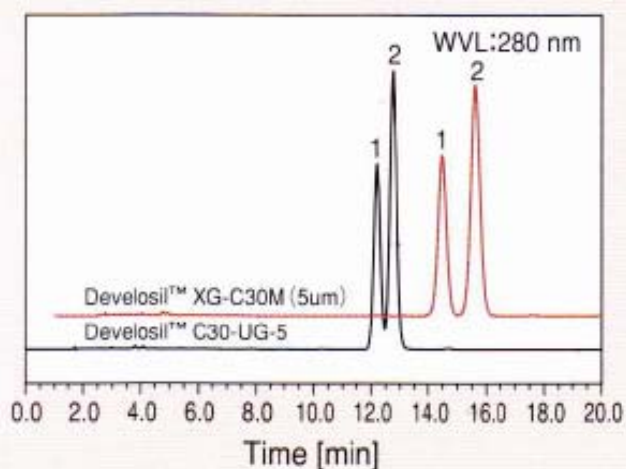
## 1. Analysis of Pyridine



Conditions :  
 Column : Develosil™ XG-C30M (5µm)  
 Size : 4.6x150mm  
 Mobile Phase : Acetonitrile/0.1%  
 Triethylamine=20/80  
 Flow rate : 1.0ml/min  
 Temperature : 40°C  
 Detection : UV254nm  
 Sample : 1.3-Aminopyridine (0.28mg/ml)  
 2.2-Aminopyridine (1.0mg/ml)  
 3.Pyridine (0.5ul/ml) / 4.2-Ethylpyridine (1.0ul/ml)  
 5.2-Propylpyridine (2.5ul/ml)  
 Injection volume : 2.0uL

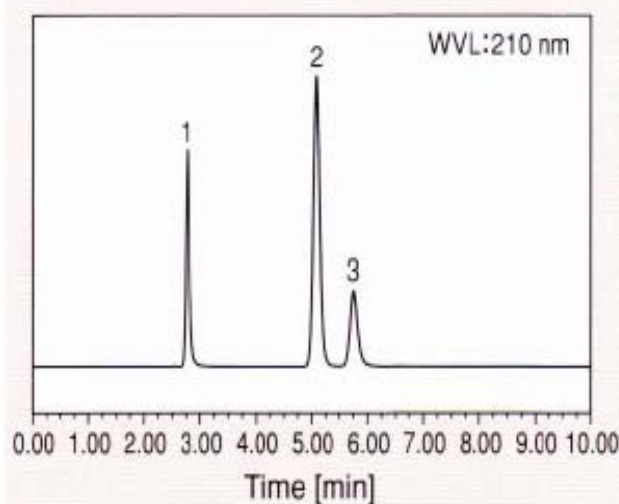


## 2. Analysis of Vitamin D2 and D3



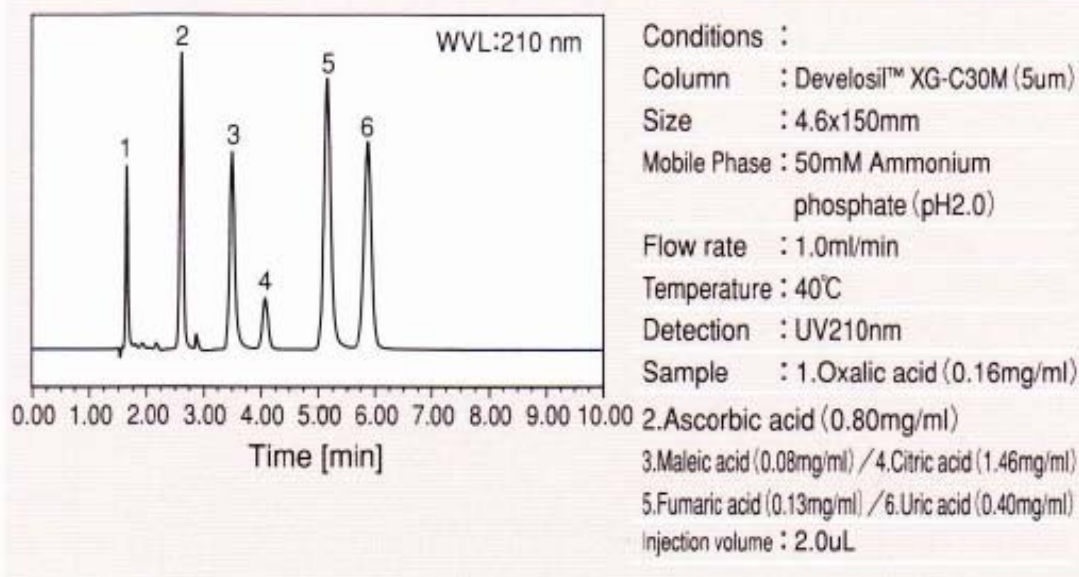
Conditions :  
 Column : Develosil™ XG-C30M (5um)  
 Develosil™ C30-UG-5  
 Size : 4.6x150mm  
 Mobile Phase : Acetonitrile  
 Flow rate : 1.0ml/min  
 Temperature : 40°C  
 Detection : UV280nm  
 Sample : 1. Vitamin D2 (1.34mg/ml)  
 2. Vitamin D3 (1.33ml/ml)  
 Injection volume : 2.0uL

## 3. Analysis of Acrylamide, Acrylic acid and Methacrylamide



Conditions :  
 Column : Develosil™ XG-C30M (5um)  
 Size : 4.6x150mm  
 Mobile Phase : Acetonitrile/0.2%  
 Phosphoric acid=1/99  
 Flow rate : 1.0ml/min  
 Temperature : 40°C  
 Detection : UV210nm  
 Sample : 1 Acrylamide (0.34mg/ml)  
 2. Acrylic acid (3.33ul/ml)  
 3. Methacrylamide (0.34mg/ml)  
 Injection volume : 2.0uL

## 4. Analysis of Acidic compounds



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