

**Enable to detect non - or semi - volatile compounds**

**Superior to traditional high and low temperature modes**

**Life of light source with constant intensity can reach 30000 hours**

**Brewster angle light trap reduces background noise**

**Anti-corrosion measures permit the use of acid-base mobile phases**

**Constant liquid level: instrument can be used continuously**

## **Model 6100 ELSD**



**32-bit CPU, frequency updated to 72MHz**

**New flow control technology makes flow more accurate and system more stable!**

**New temperature control algorithm makes heating faster and more stable!**

**Mode1 allows high and low mode coexist!**

**Mode2 preserves low temperature mode in response to existing detection methods**

**AllChrom Model 6100 ELSD  
Suitable for detecting sugars  
that can contaminate systems**

## Detection Principle of ELSD

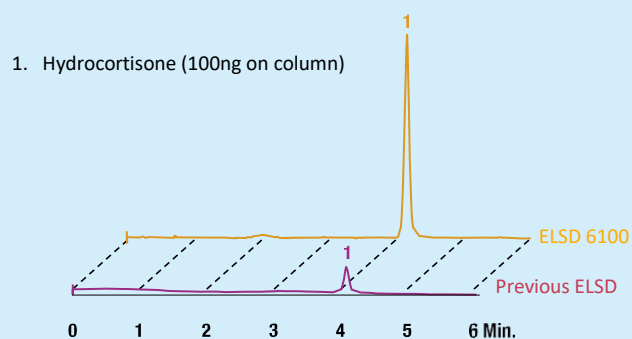
Model 6100 ELSD contains two modes to solve different problems

- By selecting Model 1, temperature of four-zone can be set independently, eliminating interference of ambient temperature difference to analysis results;
- Self-detection function, easy to troubleshoot;
- Large LCD microcomputer for easy operation of the instrument;
- 90-degree detection angle ensures that only scattered light is collected by Model 6100 ELSD;
- Mass flow meter makes gas flow rate constant and particle uniform;
- Optical cell and light trap with corrosion-resistant PTFE coating assures easy maintenance and durable system;
- Brewster angle light trap and tail blow reduce background noise.

Model 6100 ELSD retains the sensitivity of previous models when using high temperature evaporation, allowing temperature control in four zones during low temperature evaporation, reflux leaching keeps the system clean, and does not contaminate the system easily when detecting sugar substances.

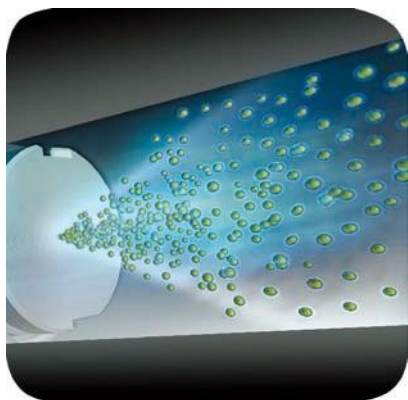
The new design avoids the trouble of manually controlling the liquid level during low temperature evaporation and the interference of ambient temperature, and ensures the stability and accuracy of the instrument.

### Comparison of Sensitivity

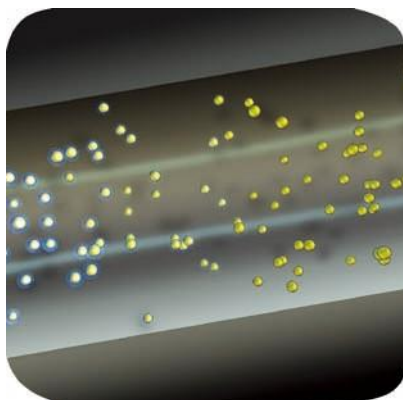


Column:               Rocksil C18, 5um, 250\*4.6mm  
 Mobile Phase:       Water:Acetonitrile (55:45)  
 Flow Rate:           1.0ml/min.  
 Column Temp:        Ambient

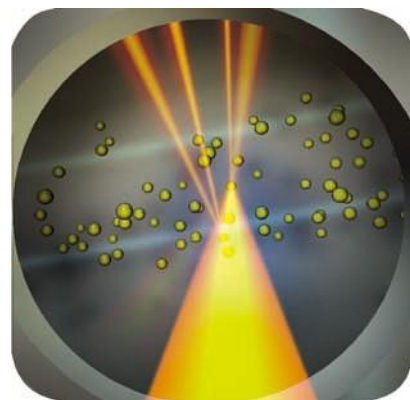
## ELSD in Three Simple Steps



1. In an atomizer, the column eluent is mixed with the gas to form a uniform, fog-like droplet.



2. The droplet passes through a heated drift tube, the mobile phase evaporates in the drift tube, and the sample forms a fog-like particle suspended in the solvent vapor.



3. The sample particles pass through an optical cell where they are irradiated by the laser beam, and the scattered light is converted into electrical signals by the photocell to be detected.

**Evaporative Light Scattering Detector (ELSD)**  
 can be used to detect any non-volatile and semi-volatile compounds

## Two Operation Modes, Wider Application Range

★ **Mode1-Best for non-volatile or semi-volatile samples**

★ **Mode2-Best for semi-volatile samples**

As the response of ELSD is based on particles amount passing through optical cell, maximum response can be obtained when 100% eluted samples are sent to detection cell. However, if testing semi-volatile samples, in order to avoid volatilization of the sample to be tested, lower evaporation temperature and gas flow rate are needed.

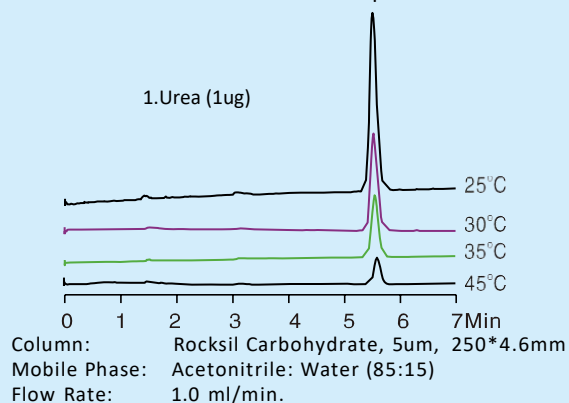
ELSD is gas-liquid-solid three-phase coexistence. When detecting non-volatile samples, high temperature evaporation can obtain high sensitivity, but it will completely evaporate the mobile phase, which will contaminate the instrument and cause large noise when analyzing sugar substances that are easy to contaminate the system. Frequent shutdown and cleaning will affect the continuous use of the instrument.

Model 6000 ELSD: Although the high temperature mode is four-zone temperature control, only drift tube temperature can be set. The temperature of atomizer, optical cell and outlet tube can only be set according to the percentage of drift tube temperature, resulting in the way of complete evaporation of mobile phase can only be chosen in high temperature mode. The uncontrolled temperature of the split-mode atomizer and the seasonal or even the ambient temperature difference in the morning, noon and evening may lead to poor reproducibility of the test results.

Model 6100 ELSD solves these problems: by selecting MODE1, the temperature of four-zone can be set independently, so that high or low temperature evaporation eliminates the interference of environmental factors on the analysis results; In the detection of sugars, you can choose a lower drift tube temperature. which makes obtaining better sensitivity, drift tube and other parts of the backflow leaching possible, and then reducing the probability of contamination of the system and avoiding the frequent cleaning of the system. In low temperature mode, the liquid level is constant and the instrument can be used continuously.

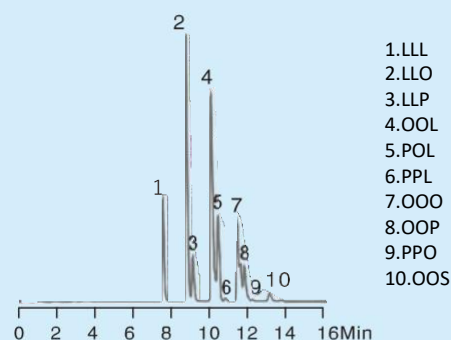
Detect Semi-volatile Samples at Room Temperature.

Detect Urea at Low Temperature



High Temperature Evaporation of Mode1 is Best for Non-volatile Samples and/or Organic Mobile Phases

Triglycerides in Sesame Oil

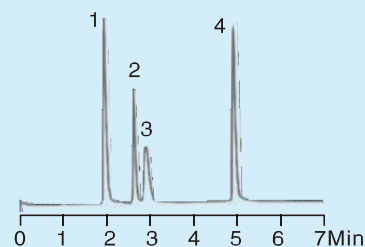


Column: Rocksil C18, 3 $\mu$ m, 150\*4.6mm  
Mobile Phase: A: Dichloromethane B: Acetonitrile  
Gradient: Time: 0 10 18 20  
                  %B: 70 55 70 70  
Flow Rate: 1.0ml/min.  
Column Temp: Ambient

Low Temperature Evaporation Maintains Stable Baselines with Rapid, Extreme Gradients

LC/MS Screening Performance Test Mix

- 1.Aspartame
- 2.Cortisone
- 3.Reserpine
- 4.Dioctyl Phthalate



Column: C18, 3 $\mu$ m, 20\*4.6mm  
Mobile Phase: A: 0.05% Formic Acid in Water  
                  B: 0.05% Formic Acid in Acetonitrile  
Gradient: Time: 0 3 7 10  
                  %B: 5 90 90 5  
Flow Rate: 1.0ml/min.  
Column Temp: 40°C

## Advantages of ELSD Compared with Other LC Detectors

Compared with other HPLC detectors, ELSD is more versatile than UV absorption detectors, and more sensitive than differential (refractive) detectors. ELSD can be used for gradient elution, while differential (refractive) detectors can not. Compared with mass spectrometry, ELSD is cheaper and less costly to use and maintain, making it suitable for the expansion of quantitative analysis techniques. As a result, ELSD has been widely used in the field of analytical technology.

RID is complicated by the interference of solvent frontiers and is extremely sensitive to temperature, making the baseline unstable. The low wavelength detection by ultraviolet detector is troubled by baseline drift under the condition of rapid gradient change and the detected compounds are required to have chromaticity groups. ELSD is not limited by these conditions. It achieves a stable baseline in multi-solvent gradients with better resolution and faster separation. The response of ELSD does not depend on the optical properties of the sample, and does not require the sample to be tested to have hair color or fluorescent groups, so the test results can more accurately reveal the mass composition of the sample.

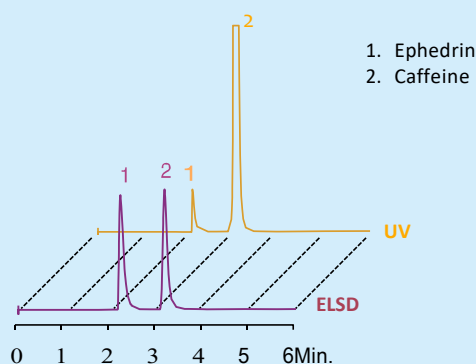
|                        | ELSD | RI | UV | MS |
|------------------------|------|----|----|----|
| Sensitivity            | ●    | ○  | ●  | ●  |
| Gradient Compatibility | ●    | ○  | ◐  | ●  |
| Baseline Stability     | ●    | ○  | ◐  | ●  |
| Solvent Interference   | ●    | ○  | ○  | ●  |
| Mass Balance           | ●    | ●  | ○  | ○  |

| Chart Key |   |
|-----------|---|
| Excellent | ● |
| good      | ◐ |
| Poor      | ○ |

### ELSD Gives More Accurate Sample Mass Composition than UV

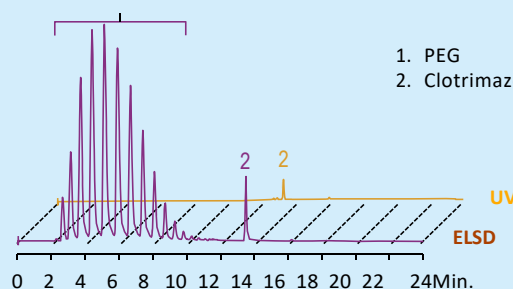
#### 1:1 Mixture



Column: Alltima HP EPS C18, 5um, 150x4.6mm  
 Mobile Phase: 1% Acetic Acid: Methanol: Acetonitrile (70:20:10)  
 Flow Rate: 1.0ml/min.  
 Column Temp: Ambient

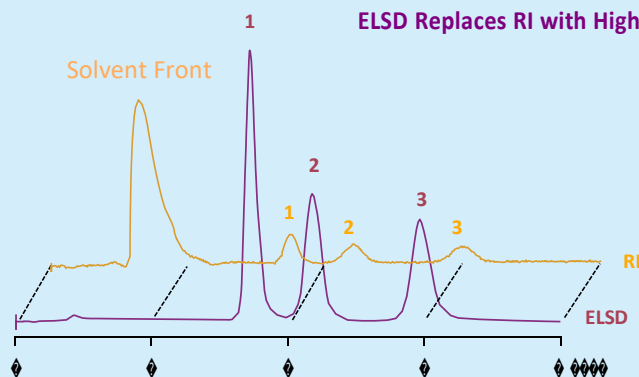
### ELSD Shows What May be Missing From UV

#### Lotrimin® AF Topical Solution



Column: C18, 5um, 150x4.6mm  
 Mobile Phase: A: Water B: Methanol  
 Gradient: Time: 0 8 10 20 25  
 %B: 30 50 100 100 30  
 Flow Rate: 1.0ml/min.  
 Column Temp: 40 °C

### ELSD Replaces RI with Higher Sensivity and Stable Baselines



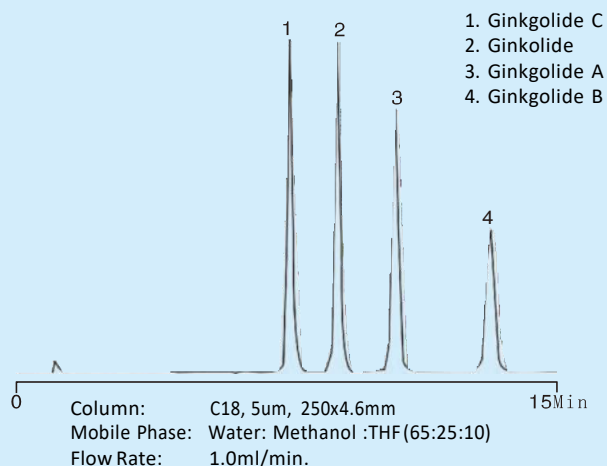
Column: Rocksil Carbohydrate, 5um, 53x7mm  
 mobile phase: Acetonitrile: Water (85:15)  
 Flow Rate: 1.0ml/min.  
 Column Temp: 30°C

## ELSD Application

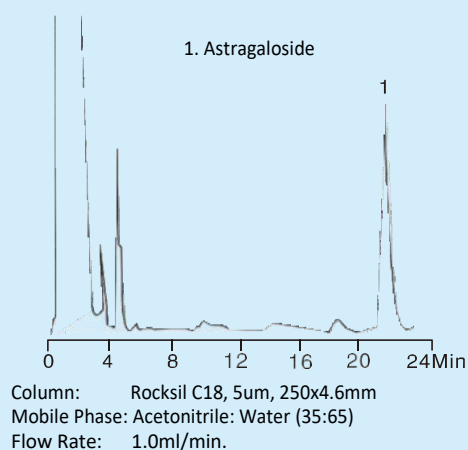
The main advantage of ELSD is that it can detect compounds that do not contain chromatic functional groups. It is mainly applied to compounds that do not have UV or fluorescence absorption, including natural products, sugars, lipids, polymers, surfactants, underived amino acids and fatty acids. Natural products mainly include natural medicine and functional food. ELSD is widely used in chemical, pharmaceutical, food and other fields. HPLC-ELSD is used as the standard method for drug and food detection in many countries.

HPLC-MS method has been widely used in the field of analysis. In the exploration of new methods, the exploration of separation method is an important step. The separations based on HPLC-ELSD and HPLC-MS are the same. HPLC-MS method is characterized by high cost and relatively troublesome operation. ELSD is generally responsive to substances that can be detected in liquid phase. HPLC-ELSD method with low cost and simple operation is available to explore the chromatographic separation method.

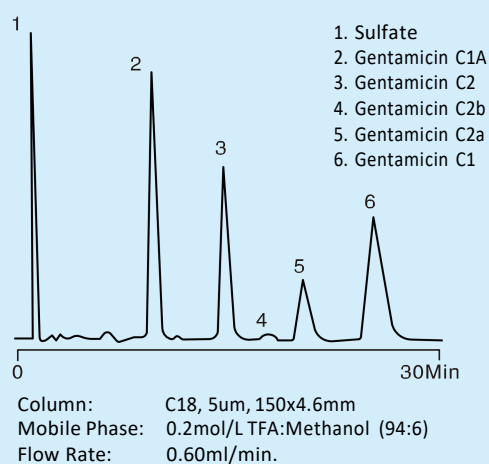
### Bilobalide



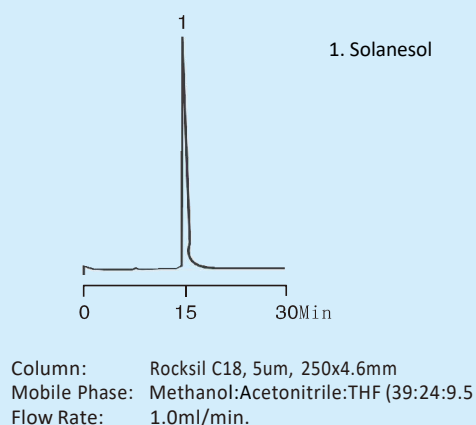
### Astragaloside



### Gentamicin

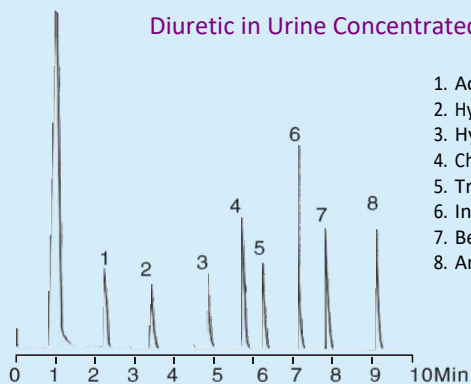


### Solanesol in Tobacco Leaves



## ELSD Application

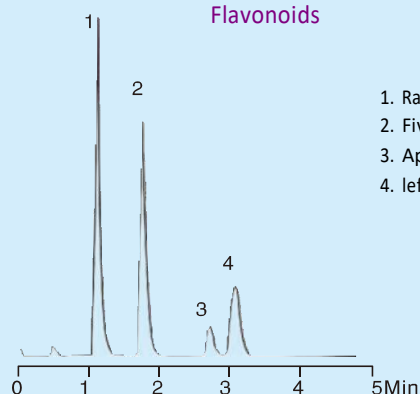
### Diuretic in Urine Concentrated by SPE



1. Acetyltrivial
2. Hydrochlorothiazide
3. Hydrofluothiazide
4. Chloride amine
5. Trichlorothiazide
6. Indapamide
7. Benzfluothiazide
8. Antidoxolone

Column: C18, 3um, 100x4.6mm  
 Mobile Phase: A: 0.1%TFA in 25mmol Ammonium Acetate  
 B: 0.1% TFA in Acetonitrile  
 Gradient: Time: 0 10  
 B%: 20 90  
 Flow Rate: 1.0ml/min.

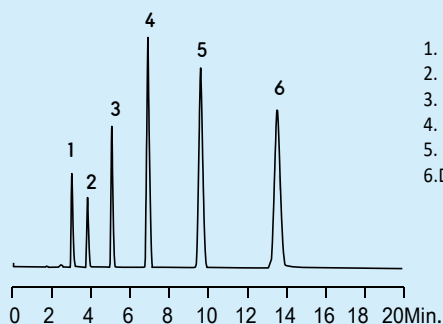
### Flavonoids



1. Raspberry Flavonoids
2. Five-hydroxyflavone
3. Apigenin
4. leftover alcohol

Column: C18, 3um, 53x7mm  
 Mobile Phase: 0.1%TFA , pH 9.95:0.1%TFA in Acetonitrile (65:35)  
 Flow Rate: 2.5ml/min.

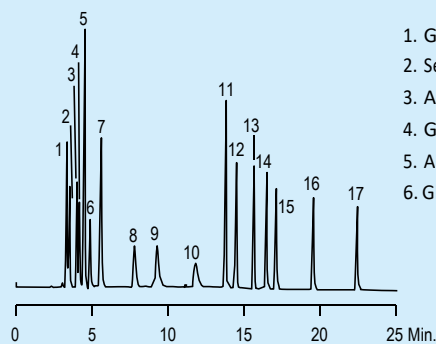
### Underived Fatty Acid



1. Lauric acid
2. Myristic acid
3. Palmitic acid
4. Stearic acid
5. Peanut acid
6. Docosanoic acid

Column: Prevail Organic Acid Column, 5um, 150x4.6mm  
 Mobile Phase: Acetonitrile: Methanol (75:25)  
 Flow rate: 1.0 ml/min.

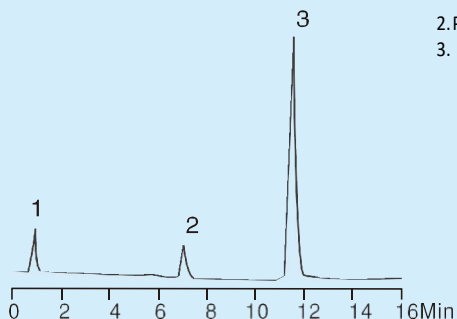
### Underived Amino Acid



1. Gly
2. Ser/Asn
3. Asp
4. Gln
5. Ala/Thr
6. Glu
7. Cys/Lys
8. His
9. Pro
10. Arg
11. Val
12. Met
13. Tyr
14. Ile
15. Leu
16. Phe
17. Trp

Column: Prevail C18, 5um, 250x4.6mm  
 Mobile Phase: A: 5mmol HFBA in 0.7%TFA, pH 1.0  
 B: Acetonitrile  
 Gradient: Time: 0 6 8 25  
 %B: 0 0 15 35  
 Flow Rate: 1.0ml/min.

### Phospholipids in Egg Yolks

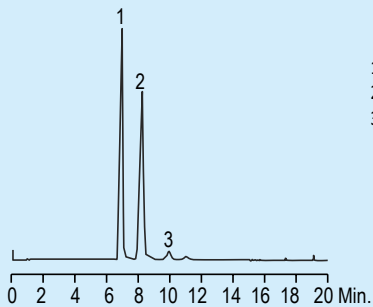


2. Phosphatidylethanolamine
3. Phosphatidylcholine

Column: Silica, 3um, 100x4.6mm  
 Mobile Phase: A: Isopropanol:Hexane:Water (58:40:2)  
 B: Isopropanol: Hexane:Water (52:40:8)  
 Gradient: Time: 0 7 19 20  
 %B: 0 100 100 100 0  
 Flow rate: 1.25 ml/min.

## ELSD Application

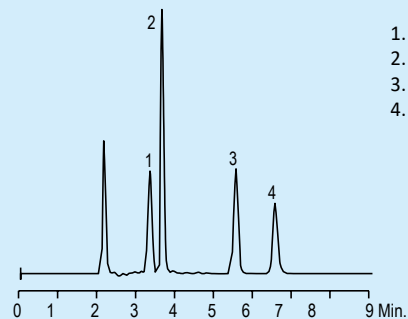
### Honey



1. Fructose
2. Glucose
3. Sucrose

Column: Rocksil Carbohydrate, 5 $\mu$ m, 250x4.6mm  
 Mobile Phase: A: 0.1% TFA in Water B: 0.1% TFA in Methanol  
 Gradient: Time: 0 15  
                   %B: 25 40  
 Flow Rate: 1.0ml/min.

### Aminoglycoside Antibiotics

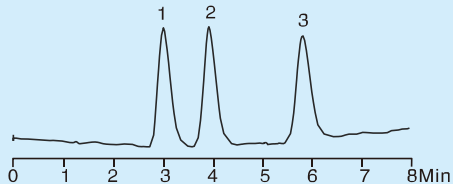


1. Streptomycin
2. Amikacin
3. Topamycin
4. Neomycin

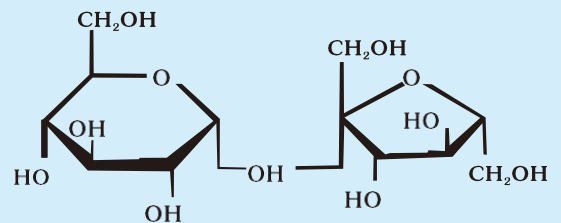
Column: C18, 5 $\mu$ m, 250x4.6mm  
 Mobile Phase: 0.3% PFA in Methanol :0.3% PFA in 43.4mmol  
 Ammonium Formate, pH 2.6 (55:45)  
 Flow Rate: 1.0ml/min.

### Glucopyranoside

1. N-octyl glucopyranoside (50ng)
2. N-decyl glucopyranoside (50ng)
3. N-dodecylglucopyranoside (50ng)

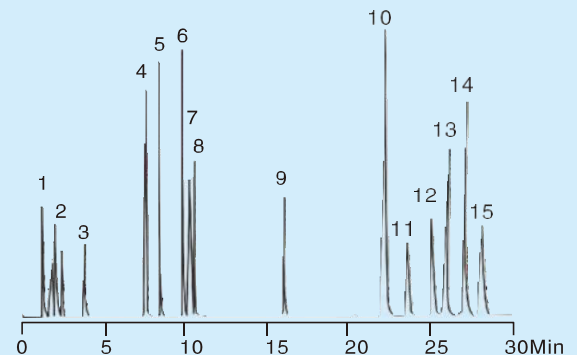


Column: C18, 3 $\mu$ m, 150x1.0mm  
 Mobile phase: Methanol: Water (90:10)  
 Flow Rate: 50ul/min.



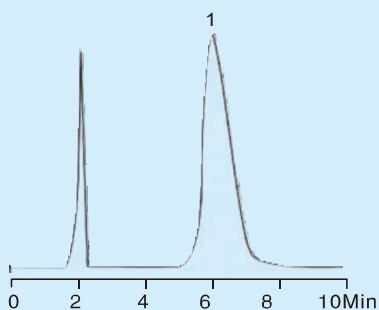
### Water Soluble and Fat Soluble Vitamins

1. Ammonium sulphate
2. Ascorbic acid
3. Niacin
4. Nicotinamide
5. Pantothenic acid
6. Riboflavin
7. Cyanocobalamin
8. Biotin
9. Vitamin A
10. D-tocopherol
11.  $\delta$ -tocopherol
12.  $\alpha$ -tocopherol
13. Vitamin D2
14. Vitamin D3
15. Vitamin K



Column: Rocksil C18, 5 $\mu$ m, 150x4.6mm  
 Mobile Phase: A: 100% Water, pH 3.2 Formic Acid Adjustment  
 B: Acetonitrile: Methanol (83:17)  
 Gradient: Time: 0 3 10 10.1 30  
                   %B: 0 0 45 100 100  
 Flow Rate: 1.5ml/min.

### 4% Polyethylene Glycol in 0.25M NaCl



1. PEG

Column: C8, 5 $\mu$ m, 250x4.6mm  
 Mobile Phase: A: Water B: Methanol  
 Gradient: Time: 0 20  
                   %B: 45 90  
 Flow Rate: 1.0 ml/min.

## Model 6100 Evaporative Light Scattering Detector (ELSD)

| Model 6100 ELSD Specifications      |  |                          |   |                   |
|-------------------------------------|--|--------------------------|---|-------------------|
| Operation Mode                      | <p>Mode1/Mode2 dual mode, according to the needs of detection can be freely selected. Detecting semi-volatile substances, low temperature evaporation is selected to reduce sample volatilization and improve the sensitivity. Mode1: when detecting non-volatile substances using high temperature evaporation detection mode, column eluent fully enters the optical cell for maximum sensitivity. MODE2 can only be used for low-temperature evaporation detection, and the atomizer has no temperature control function. The purpose of retaining MODE2 is to facilitate users to cope with existing detection methods.</p> <p>6100 ELSD retains the benefits of the 6000 ELSD and expands the range of ELSD applications. Mode1 realizes four-zone temperature control for high and low temperature evaporation detection. The four-zone temperature can be set as required, eliminating the influence of environmental temperature difference on detection results, facilitating the optimization of detection conditions, and bringing convenience to scientific research and method exploration.</p> |                          |   |                   |
| Liquid Level                        | <p>Model 6100 ELSD liquid level automatic adjustment, no manual control of liquid level. Model 6100 ELSD in low temperature evaporation detection, a large amount of waste liquid will not lead to the liquid level change, drift tube and other parts of the automatic backflow leaching. This makes the system is not easy to contaminate and can be used sustainably.</p>   |                          |   |                   |
| Light Source                        | <p>Laser diode with collimating optics, 650nm, 30mW output, class IIIB. The life of the light source is up to 30,000 hours, and the light intensity remains constant during the effective life. The brewster angle light trap is used to reduce the background noise effectively.</p>  |                          |   |                   |
| Detection Angle                     | <p>90-degree detection angle ensures that only scattered light is received. It avoids the refraction or diffracted light easily received by the same type detector of some manufacturers when it is detected from an angle greater than 90 degrees, and also avoids the reflected light easily received by the detector of some manufacturers when it is detected from an angle smaller than 90 degrees. Refraction, diffraction and reflected light can easily lead to false detection signals.</p>   |                          |   |                   |
| Detection Limit                     | Determine hydrocortisone, SNR is 5   |                          |   |                   |
|                                     | Column Type  | Standard Column          | Narrow Column   | Micro Size Column |
|                                     | Detection Limit  | 2ng                      | 0.5ng   | 0.1ng             |
| Temperature Setting                 | <p>Mode1: The temperature in four-zone of atomizer, drift tube, optical cell and outlet tube can be set independently. The temperature difference between the atomizer and the outlet pipe is constant, the processing time of the sample in the drift tube is kept constant.</p>  |                          |   |                   |
| Nebulizer Gas                       | 0-5L/min, adjustable, digital flowmeter control, gas flow not affected by system pressure changes  |                          |   |                   |
| Drift Tube Structure                | Stainless steel (excluding fragile glass and corrosion-prone components such as copper)  |                          |   |                   |
| Inlet Pressure                      | 60-80 PSIG   | Function of tail blowing | Yes   |                   |
| Signal Reset to Zero                | Yes  | RS232 interface          | Yes   |                   |
| Gas Switching Control               | Automatic  | Error correction system  | Intelligent control and correction of gas flow and temperature. |                   |
| Security Function                   | <p>Automatic alarm for error. Using laser light source safety protection switch, laser leakage Hall sensor will automatically disconnect. Laser power supply, prevent laser leakage damage to human eyes.</p>  |                          |   |                   |
| Selection and Display of Parameters | <p>10 kinds of methods can be stored, and the instrument is initialized quickly and reliably. LCD chart display with numeric keypad control, or PC control.</p>  |                          |   |                   |
| Signal Output                       | <p>Digital and analog dual output. Digital output: -2500mV-2500mV. Analog output: 0-1000mV 0-500mV, 0-100mV or 0-10mV, 4 options, 5 levels of attenuation, adjustable.</p>   |                          |   |                   |
| Applied Range                       | Detect semi-volatile and non-volatile compounds  |                          |   |                   |
| Power Supply                        | 120/240V, 50/60Hz  | Weight                   | 35 Pounds (16 kg)   |                   |
| Dimensions                          | 23.0 "H x 12.5" W x 21.6 "D (58.4cm H x 31.8cm W x 54.8cm D)   |                          |   |                   |

**Order No.: 15006100**

### Contact us:

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