Alltech® 3300 ELSD

Simplify Detection of Difficult Compounds

sensitive

Low nanogram detection limits

simple

Easiest to use and maintain

small

Integrates easily with any HPLC

GRACE

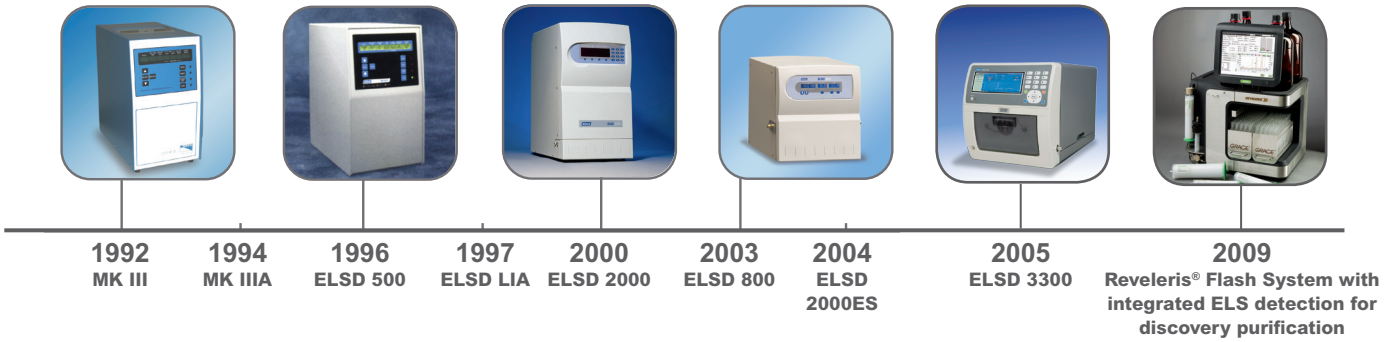
Materials Technologies

Discovery Sciences

Brochure# 531a

Leading the Way in ELSD Technology for More than 20 Years

No one has more expertise designing and manufacturing ELSDs than Grace Discovery Sciences. Our continued innovation drives the evolution of our ELSD technology.



ELSD Advantages

Universal

- Have confidence you're seeing everything in your sample
- Improve quantitative measurements
- Estimate purity more accurately

Sensitive

- Detection limits in the low nanogram range

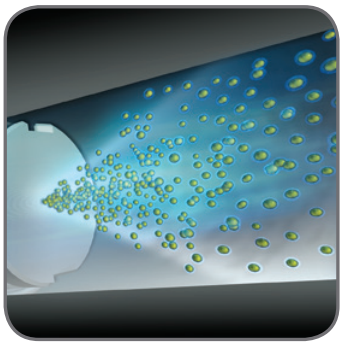
Gradient Compatible

- Maintain stable baselines during steep gradients

Alltech® ELSDs simplify analysis of difficult compounds:

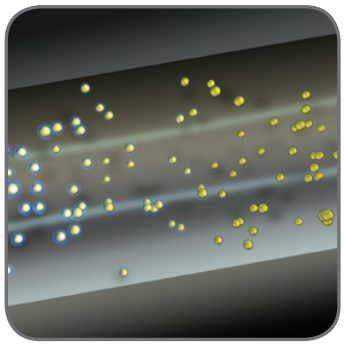
- pharmaceuticals
- impurities
- phospholipids
- fatty acids
- surfactants
- nutraceuticals
- excipients
- amino acids
- triglycerides
- polymers
- carbohydrates
- peptides

ELSD Detection Process:



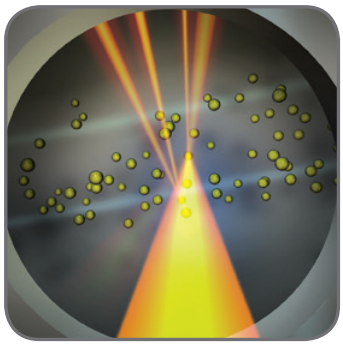
1. Nebulization

Column effluent passes through a needle and mixes with nitrogen gas to form a dispersion of droplets.



2. Evaporation

Droplets pass through a heated "drift tube" where the mobile phase evaporates, leaving a fine mist of dried sample particles in solvent vapor.



3. Detection

The sample particles pass through a cell and scatter light from a laser beam. The scattered light is detected, generating a signal.

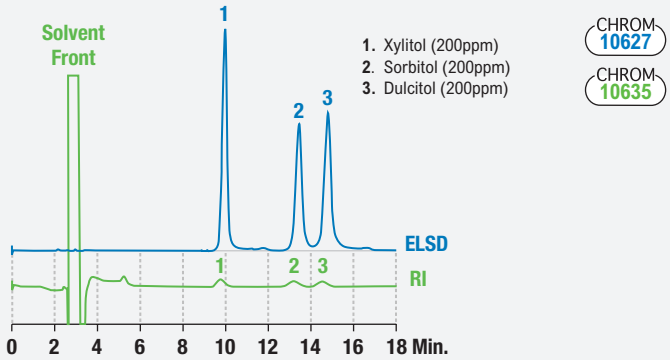
ELSD Advantages Over Other LC Detectors

	ELSD	RI	UV	MS
Sensitivity	●	○	●	●
Gradient Capability	●	○	◒	●
Baseline Stability	●	○	◒	●
Solvent Interference	●	○	○	●
Mass Balance	●	●	○	○

CHART KEY	
Excellent:	●
Good:	◒
Poor:	○

ELSD improves baseline stability and detection sensitivity compared to refractive index (RI)

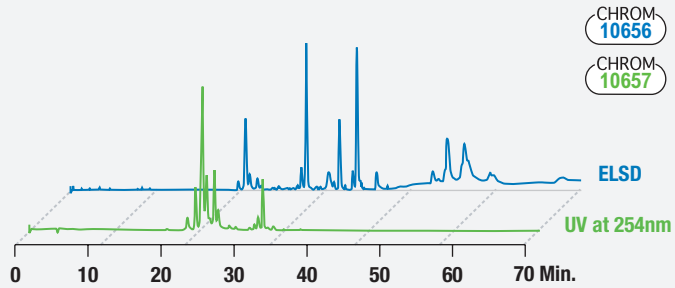
Sugar Alcohols



Column: Alltech® Prevail™ Carbohydrate ES column, 5µm, 250 x 4.6mm, (**Part No. 35101**)
Mobile Phase: Acetonitrile:Water (79:21)
Flow Rate: 1.0 mL/min
Column Temp: 30°C

ELSD shows what may be missing from your UV chromatogram

Plant Oil Extract



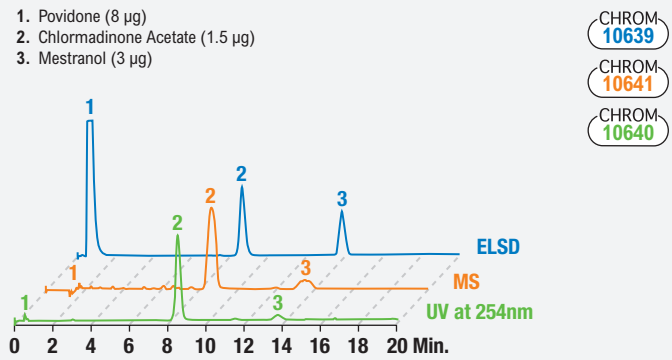
Column: Alltech® Alltima™ C18 column, 3µm, 150 x 2.1mm, (**Part No. 43852**)
Mobile Phase: **A:** 0.1% Formic Acid **B:** Methanol
Gradient:

Time:	0	40
%B:	60	100

Flow Rate: 0.25 mL/min
Column Temp: 30°C

Use ELSD in parallel with UV/Vis and MS for maximum structural and concentration information

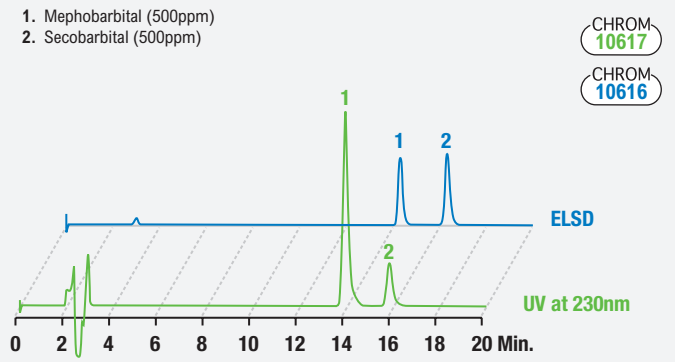
Steroid Hormone Formulation



Column: Vydac® Denali® 238DE C18 column, 3µm, 50 x 2.1mm, (**Part No. 238DE3205**)
Mobile Phase: 0.2% Formic Acid in Acetonitrile:Water (55:45)
Flow Rate: 0.2 mL/min
Column Temp: Ambient

ELSD obtains a more accurate representation of sample mass than UV/Vis

1:1 Mixture



Column: Alltech® Alltima™ HP C18 HL column, 5µm, 250 x 4.6mm, (**Part No. 87698**)
Mobile Phase: Acetonitrile:Water (30:70)
Flow Rate: 1.0 mL/min
Column Temp: 45°C

Sensitive & Reproducible

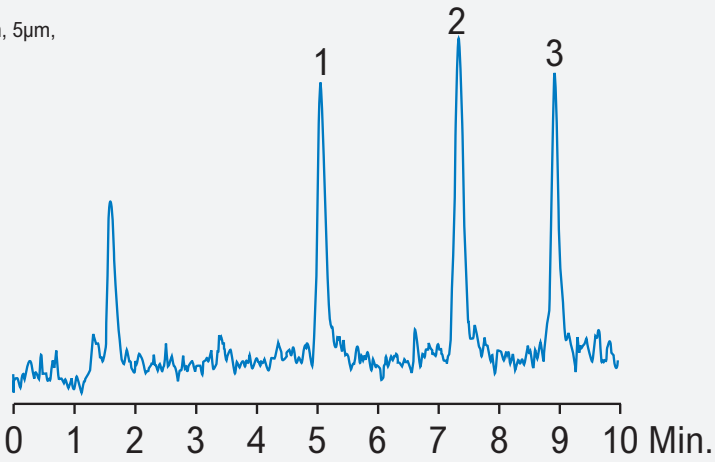
Low noise and excellent baseline stability allows detection limits in the low nanogram range

Low Level Detection - 10ng on Column

Column: Prevail™ Carbohydrate ES Column, 5µm, 150 x 4.6mm, (**Part No. 35102**)
Mobile Phase: **A:** Water **B:** Acetonitrile
Gradient:

Time:	0	10	11	14
%B:	80	50	80	80

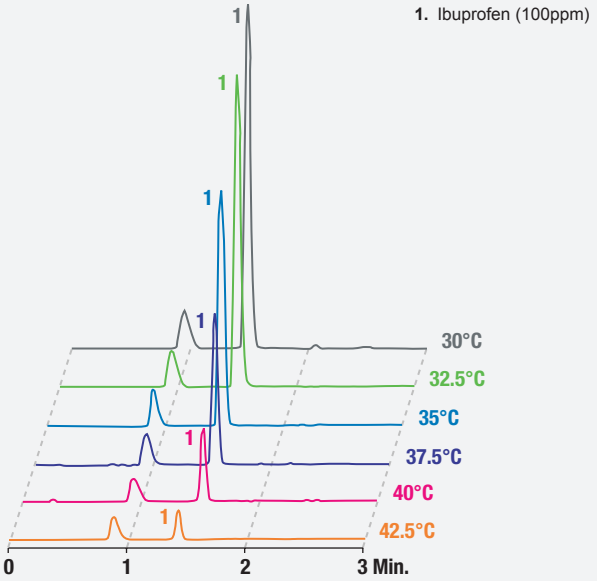
Flow Rate: 1.0 mL/min
Detector: ELSD
Column Temp: Ambient



CHROM 10498

1. Fructose
2. Sucrose
3. Raffinose

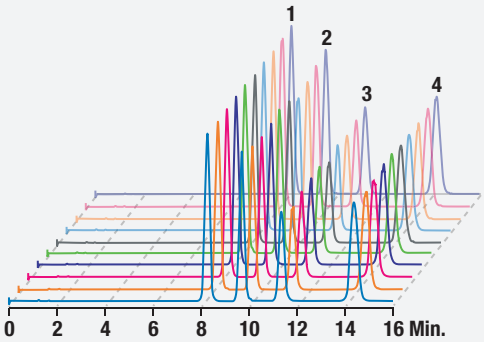
The 3300 ELSD's near ambient temperature evaporation maximizes SENSITIVITY FOR SEMI-VOLATILES



Column: Alltech® Alltima™ HP C18 column, 3µm, 100 x 2.1mm, (**Part No. 87669**)
Mobile Phase: Acetonitrile: 0.1%TFA in Water (80:20)
Flow Rate: 0.3 mL/min
Column Temp: Ambient

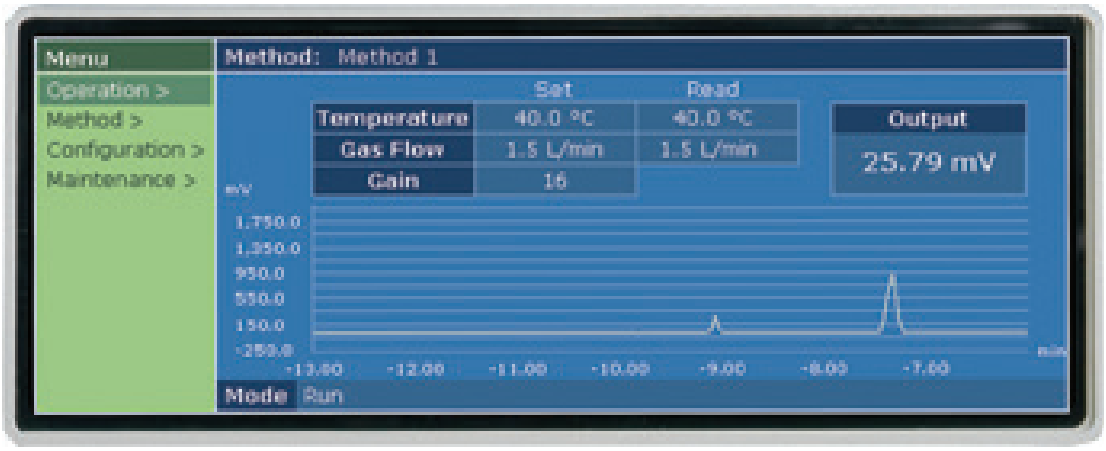
The 3300 ELSD is very REPRODUCIBLE as demonstrated by 10 identical injections of four ginkgolide components

Component	% RSD
1. **Bilobalide**	1.7
2. Ginkgolide C	1.3
3. Ginkgolide A	1.6
4. Ginkgolide B	1.0

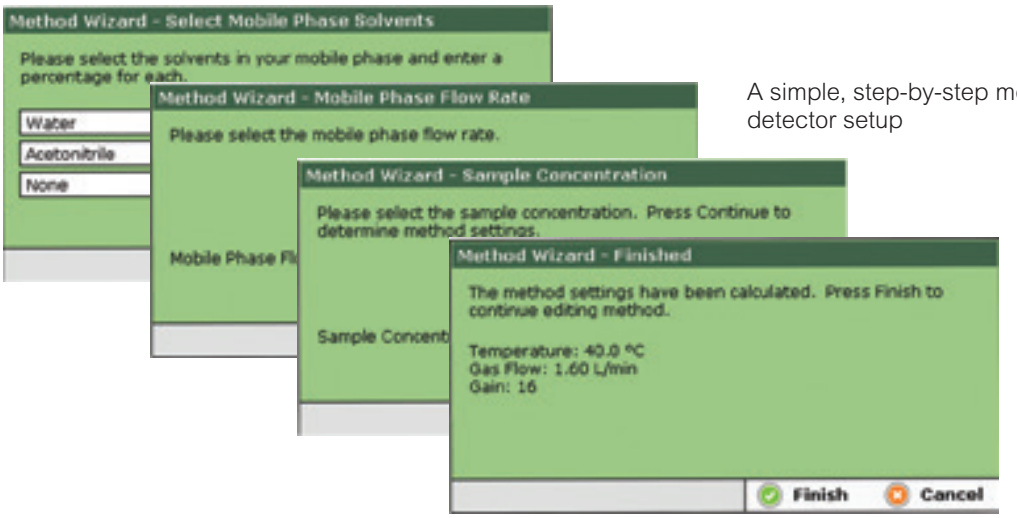


Column: Alltech® Platinum™ C18 column, 5µm, 250 x 4.6mm, (**Part No. 32064**)
Mobile Phase: Water:Methanol:THF (65:25:10)
Flow Rate: 1.0 mL/min
Column Temp: Ambient

Easy To Use



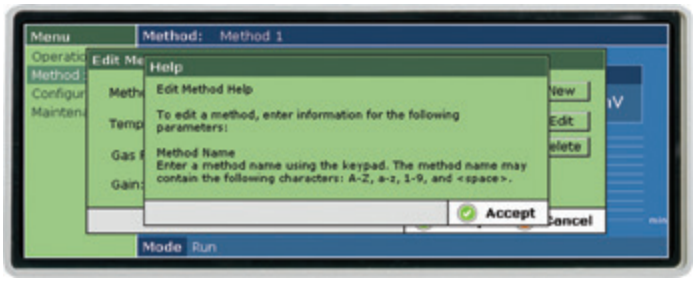
A Windows®-based user interface makes navigating through menus intuitive and easy. All critical operating parameters and a scrolling chromatogram trace are shown on the large, full color LCD.



A simple, step-by-step method wizard guides you through detector setup

Select from seven different languages for the user interface:

- English
- Español
- Francais
- Deutsch
- Italiano
- Japanese
- Chinese



An informative help function is available in each screen

Additional Features:

- Control and collect data digitally through Agilent ChemStation and EZchrom software platforms, including OpenLAB
- Ensure GLP compliance with password protected screen and error log
- Store up to 100 methods for fast set up
- Save gas and extend optics lifetime by programming unit to enter stand by mode at end of run

Easy To Maintain

Maintenance Made Simple!

Parts requiring cleaning or service are accessible from the front

Remove the nebulizer with a simple twist and pull

Clean the drift tube easily with the included custom brush

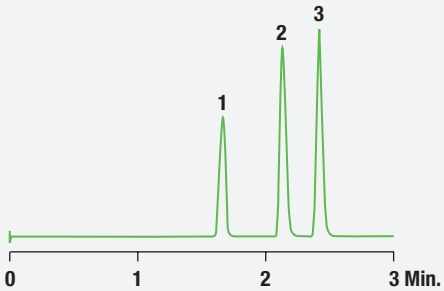
Onboard diagnostics automate the troubleshooting process

Full IQ/OQ/PQ Protocols Available

We make it easy for you to integrate the ELSD into a qualified HPLC system. The 3300 ELSD is thoroughly tested before shipment and calibration and performance documents are included with each instrument. We also provide the option of onsite qualification performed by one of our service engineers.

ELSD Applications

Stable Baselines with Fast, Steep Gradients



CHROM 10658

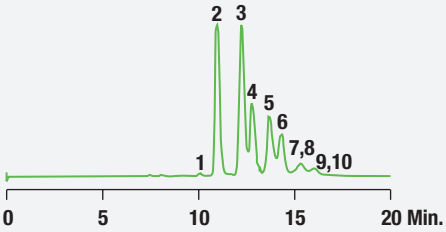
1. Acetylsalicylic Acid
2. Diphenhydramine
3. Trimipramine

Column: Alltech® Alltima™ HP C18 column, 3µm, 33 x 7mm, (**Part No. 87671**)
Mobile Phase: A: 0.1%TFA in Water B: 0.1% TFA in Acetonitrile
Gradient:

Time:	0	3
%B:	10	90

Flow Rate: 2.5 mL/min
Column Temp: 30°C

Use ELSD to Trigger Collection of UV Transparent Compounds in Prep Applications



CHROM 10679

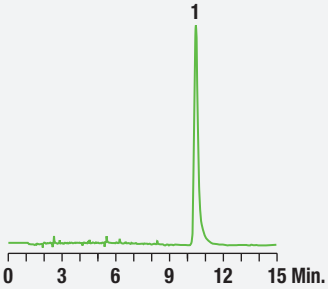
1. LLLn
2. LLL
3. LLO
4. PLL
5. LOO
6. PLO
7. PLP
8. OOO
9. SLO
10. POO

Column: Vydac® Denali® 238DE C18 column, 10µm, 150 x 22mm, (**Part No. 238DE102215**)
Mobile Phase: A: Acetonitrile B: Dichloromethane
Gradient:

Time:	0	10	20	21
%B:	45	50	70	45

Flow Rate: 10 mL/min
Column Temp: 25°C

Simplify Detection of Weak Absorbing Polymers



CHROM 10636

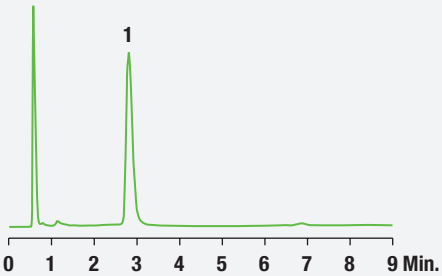
1. mPEG-SBA

Column: Alltech® ProSphere™ 300 column, 5µm, 150 x 4.6mm, (**Part No. 35560**)
Mobile Phase: A: Water B: Acetonitrile
Gradient:

Time:	0	3	15
%B:	30	30	80

Flow Rate: 1.0 mL/min
Column Temp: Ambient

Easily Detect Non-Chromophoric Drug Compounds



CHROM 10680

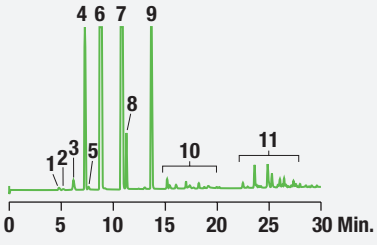
1. Spectinomycin

Column: Alltech® Alltima™ HP C18 Amide column, 3µm, 50 x 4.6mm, (**Part No. 87829**)
Mobile Phase: 10mM Ammonium Carbonate:Acetonitrile (98:2)
Flow Rate: 1.0 mL/min
Column Temp: Ambient

Detect Difficult Samples without Derivatizing

Biodiesel Derived from Soy Bean Oil

CHROM 10644



1. Mono-acylglycerol (MAG)
2. MAG
3. MAG
4. Fatty Acid Methyl Ester (FAME)
5. MAG
6. FAME
7. FAME
8. MAG
9. FAME
10. Di-acylglycerol (DAG)
11. Tri-acylglycerol (TAG)

Column: Alltech® Alltima™ HP C18 HiLoad column, 5µm, 250 x 4.6mm, (**Part No. 87698**)
Mobile Phase: **A:** Acetonitrile **B:** Dichloromethane
Gradient:

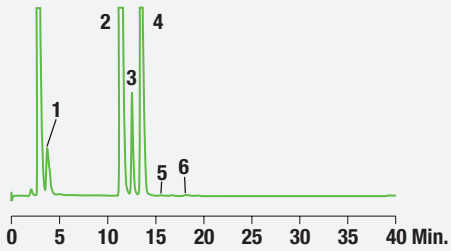
Time:	0	5	30	32	35
%B:	0	15	70	70	0

Flow Rate: 1.0 mL/min
Column Temp: Ambient

Improve Sensitivity for Carbohydrates

Robitussin® Flu Syrup

CHROM 10557



1. Sucralose
2. Fructose
3. Sorbitol
4. Glucose
5. Sucrose
6. Maltose

Column: Alltech® Prevail™ Carbohydrate ES column, 5µm, 250 x 4.6mm, (**Part No. 35101**)
Mobile Phase: **A:** Acetonitrile **B:** Water
Gradient:

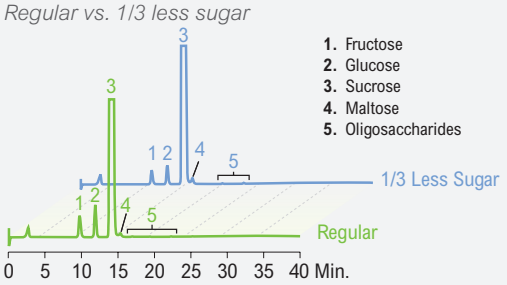
Time:	0	5	10	15	25
%B:	15	15	25	25	50

Flow Rate: 1.0 mL/min
Column Temp: Ambient

ELSD Applications

Kellogg's Frosted Flakes® Cereal

Regular vs. 1/3 less sugar



1. Fructose
2. Glucose
3. Sucrose
4. Maltose
5. Oligosaccharides

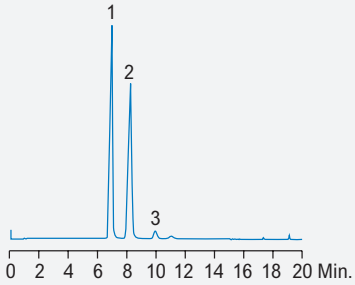
CHROM 10528
CHROM 10527

Column: Prevail™ Carbohydrate ES Column, 5µm, 250 x 4.6mm, (Part No. **35101**)
Mobile Phase: **A:** Acetonitrile **B:** Water
Gradient:

Time:	0	5	10	15	25
%B:	20	20	30	30	50

Flow Rate: 1.0mL/min
Detector: ELSD
Column Temp: Ambient

Clover Honey



CHROM 9365

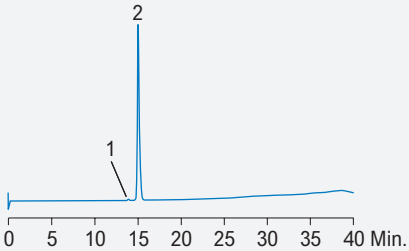
1. Fructose
2. Glucose
3. Sucrose

Column: Prevail™ Carbohydrate ES Column, 5µm, 250 x 4.6mm, (Part No. **35101**)
Mobile Phase: **A:** Acetonitrile **B:** Water
Gradient:

Time:	0	15
%B:	25	40

Flow Rate: 1.0mL/min
Detector: ELSD
Column Temp: Ambient

Infant Formula



CHROM 10529

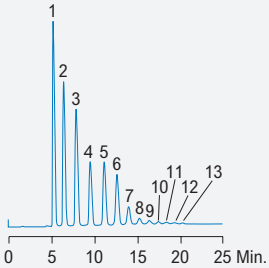
1. Sucrose
2. Lactose

Column: Prevail™ Carbohydrate ES Column, 5µm, 250 x 4.6mm, (Part No. **35101**)
Mobile Phase: **A:** Acetonitrile **B:** Water
Gradient:

Time:	0	5	10	15	25
%B:	20	20	30	30	50

Flow Rate: 1.0mL/min
Detector: ELSD
Column Temp: Ambient

Corn Syrup Solids



CHROM 9354

1. Dextrose
2. Maltose
3. Maltotriose
4. Maltotetraose
5. Maltopentaose
6. Maltohexaose
7. Maltoheptaose
8. Maltooctaose
9. Maltononaose
10. Maltodecaose
11. Maltoundecaose
12. Maltododecaose
13. Maltotridecaose

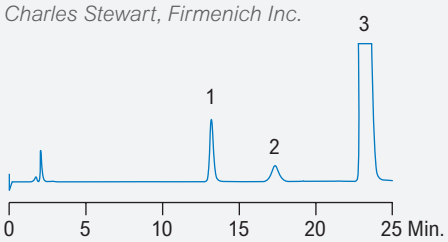
Column: Prevail™ Carbohydrate ES Column, 5µm, 250 x 4.6mm, (Part No. **35101**)
Mobile Phase: **A:** Acetonitrile **B:**Water
Gradient:

Time:	0	15
%B:	35	50

Flow Rate: 1.0mL/min
Detector: ELSD
Column Temp: Ambient

Flavor Sample Solution

Chromatogram courtesy of Charles Stewart, Firmenich Inc.



CHROM 10579

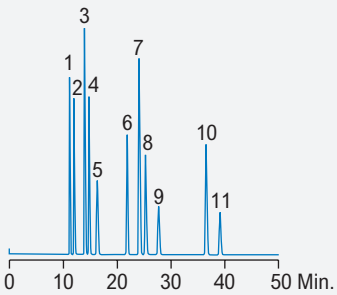
1. Fructose
2. Glucose
3. Sucrose

Column: Prevail™ Carbohydrate ES Column, 5µm, 250 x 4.6mm, (Part No. **35101**)
Mobile Phase: **A:** Acetonitrile **B:** Water
Gradient:

Time:	0	30
%B:	20	29

Flow Rate: 1.0mL/min
Detector: ELSD
Column Temp: Ambient

Vegetable Fermentation Broth Standards



CHROM 10004

1. iso-erythritol
2. Fructose
3. Sorbitol
4. Mannitol
5. Glucose
6. Inositol
7. Sucrose
8. Maltitol
9. Maltose
10. Raffinose
11. Maltotriose

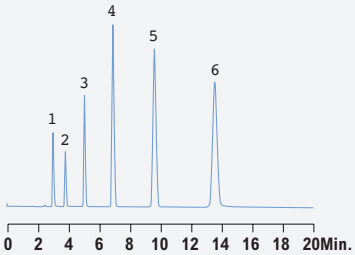
Column: Prevail™ Carbohydrate ES Column, 250 x 4.6mm, (Part No. **35101**)
Mobile Phase: **A:** Acetonitrile **B:** 0.04% NH_4OH
Gradient:

Time:	0	60
%B:	17	35

Flow Rate: 1.0mL/min
Detector: ELSD
Column Temp: Ambient

ELSD Applications

Underivatized Fatty Acids

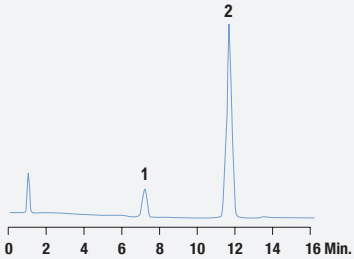


CHROM 9539

1. Lauric Acid
2. Myristic Acid
3. Palmitic Acid
4. Stearic Acid
5. Arachidic Acid
6. Behenic Acid

Column: Prevail™ Organic Acid column, 5µm, 150 x 4.6mm,
Mobile Phase: Acetonitrille:Methanol (75:25)
Flow Rate: 1.0mL/min
Detector: ELSD

Egg Yolk Phospholipids



CHROM 10214

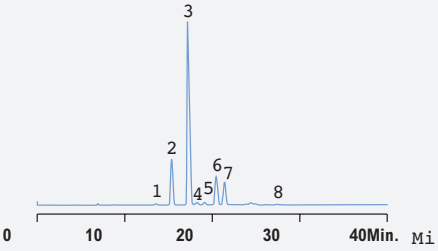
1. Phosphatidylethanolamine
2. Phosphatidylcholine

Column: Allsphere™ Silica column, 3µm, 100 x 4.6mm
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	0

Flow Rate: 1.25mL/min
Detector: ELSD

Triglycerides in Evening Primrose



CHROM 10047

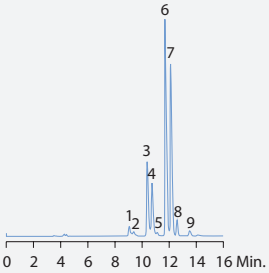
1. LGG
2. LGL
3. LLL
4. OGL
5. PGL
6. OLL
7. OGO + PLL
8. OOO

Column: Alltima™ C18 column, 5µm, 250 x 4.6mm
Mobile Phase: **A:** Acetonitrile **B:** Dichloromethane
Gradient:

Time:	0	40
%B:	30	50

Flow Rate: 1.0mL/min
Detector: ELSD

Tryglycerides in Olive Oil



CHROM 9515

1. LLO
2. LLP
3. OOL
4. POL
5. PPL
6. OOO
7. OOP
8. PPO
9. OOS

Column: Alltima™ C18 column, 3µm, 150x 4.6 mm
Mobile Phase: **A:** Dichloromethane **B:** Acetonitrile
Gradient:

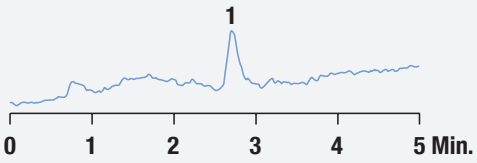
Time:	0	10	18	20
%B:	70	55	70	70

Flowrate: 1.5mL/min
Detector: ELSD

Glucopyranoside (low level)

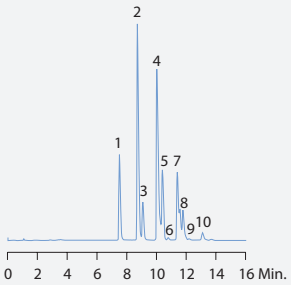
CHROM 10225

1. n-Decyl β-D-Glucopyranoside (9ng on-column)



Column: Alltima™ C18 column, 3µm, 150 x 2.1mm
Mobile Phase: Methanol:Water (90:10)
Flowrate: 0.2mL/min
Detector: ELSD

Triglycerides in Sesame Seed Oil



CHROM 9517

1. LLL
2. LLO
3. LLP
4. OOL
5. POL
6. PPL
7. OOO
8. OOP
9. PPO
10. OOS

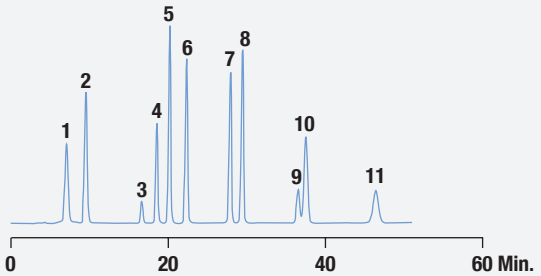
Column: Alltima™ C18 column, 3µm, 150 x 4.6 mm
Mobile Phase: A:Dichloromethane B:Acetonitrile
Gradient:

Time:	0	10	18	20
%B:	70	55	70	70

Flowrate: 1.0mL/min
Detector: ELSD

ELSD Applications

Separation of Ginsenosides in Korean Ginseng



CHROM 10142

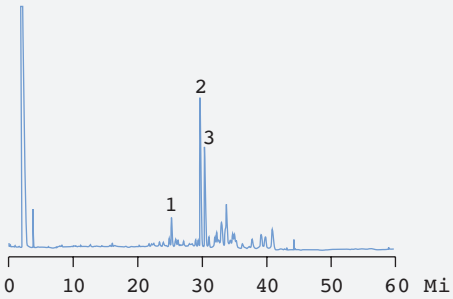
1. Rh2
2. Rh1
3. Rg2
4. Rg3
5. Rg1
6. Rf
7. Re
8. Rd
9. Rc
10. Rb2
11. Rb1

Column: Prevail™ Carbohydrate ES column, 5µm, 250 x 4.6mm
Mobile Phase: **A:** Acetonitrile:Water:Isopropyl Alcohol (80:5:15)
B: Acetonitrile:Water:Isopropyl Alcohol (67:21:12)
Gradient:

Time:	0	28	35	45	50	51	57
%B:	25	85	80	75	90	100	25

Flowrate: 0.8mL/min
Detector: ELSD

Black Cohosh



CHROM 9496

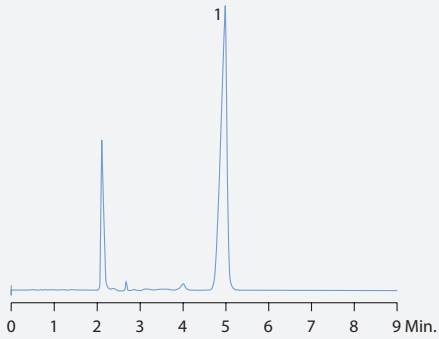
1. Cimiracemoside A
2. Actein
3. 27-deoxyactein

Column: Prevail™ C18 column, 5µm, 250 x 4.6mm
Mobile Phase: **A:** 1% Formic Acid **B:** ACN
Gradient:

Time:	0	60	65	67	80
%B:	20	100	100	20	20

Flowrate: 1mL/min
Detector: ELSD

Neomycin Extracted from Neo-Cinolone Cream

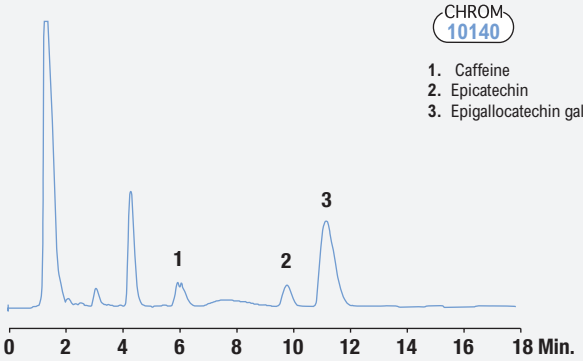


CHROM 9216

1. Neomycin

Column: Alltima™ C18 column, 5µm, 250 x 4.6mm
Mobile Phase: 0.3% Pentafluoropropionic Acid in Methanol: 0.3% Pentafluoropropionic Acid in 43.4mM Ammonium Formate, pH 2.6 (55:45)
Flowrate: 1.0mL/min
Detector: ELSD

Catechins in Green Tea - Prep Scale

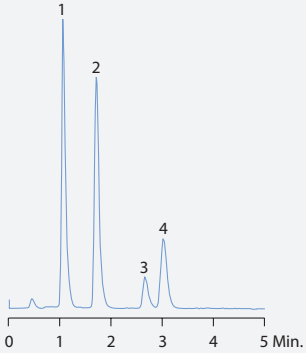


CHROM 10140

1. Caffeine
2. Epicatechin
3. Epigallocatechin gallate

Column: Alltima™ C18 column, 5µm, 150 x 22mm
Mobile Phase: 0.05% TFA:Acetonitrile (87:13)
Flowrate: 23mL/min
Detector: ELSD

Flavonoids



CHROM 9271

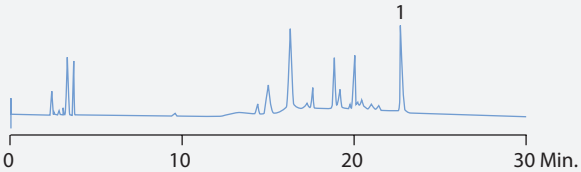
1. Myricetin
2. Quercetin
3. Apigenin
4. Kaempferol

Column: Alltima™ C18 column, 3µm, 53 x 7mm
Mobile Phase: 0.1% TFA in Water, pH 0.95:0.1% TFA in ACN (65:35)
Flowrate: 2.5ml/min
Detector: ELSD

Ginkgo Biloba Extract

1. Ginkgolide B

CHROM 9019



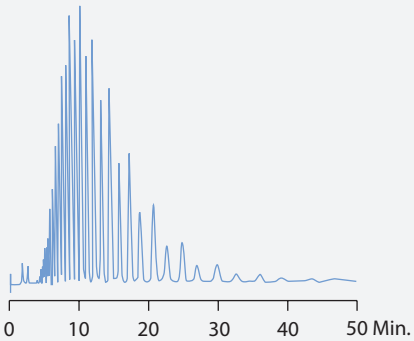
Column: Adsorbosphere® C8 column, 5µm, 250 x 4.6mm
Mobile Phase: **A**: 5% Acetonitrile in 0.1% TFA
B: 70% Acetonitrile in 0.1% TFA
Gradient:

Time:	0	30	35	40
%B:	0	75	75	0

Flowrate: 1.0mL/min
Detector: ELSD

ELSD Applications

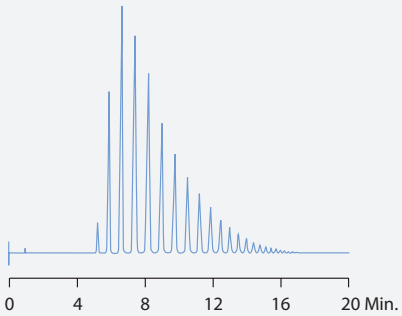
Tween 80



CHROM 9017

Column: Alltima C18 column, 5µm, 250 x 4.6mm
Mobile Phase: Water:Methanol (60:40)
Flowrate: 1.0mL/min
Detector: ELSD

Dimethicone



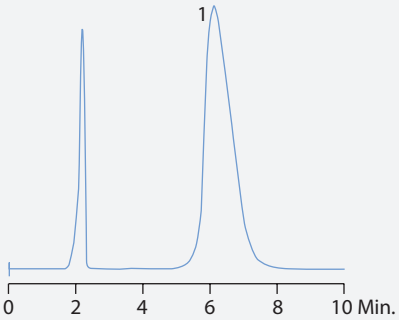
CHROM 8636

Column: Alltima™ C8 column, 5µm, 150 x 4.6mm
Mobile Phase: A: Acetonitrile B: Chloroform
Gradient:

Time:	0	20
%B:	25	75

Flowrate: 1.0mL/min
Detector: ELSD

4% Polyethylene Glycol in 0.25M NaCl



CHROM 9018

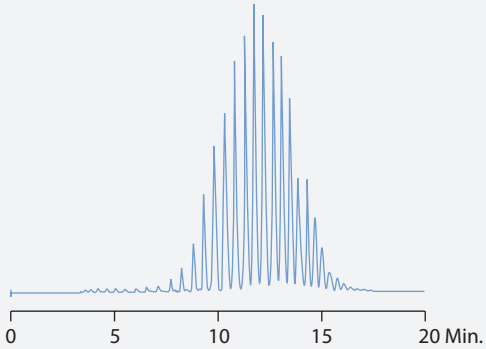
1. PEG

Column: Adsorbosphere® C8 column, 5µm, 250 x 4.6mm
Mobile Phase: **A**: Water **B**: Methanol
Gradient:

Time:	0	20
%B:	45	90

Flowrate: 1.0mL/min
Detector: ELSD

PEG 600



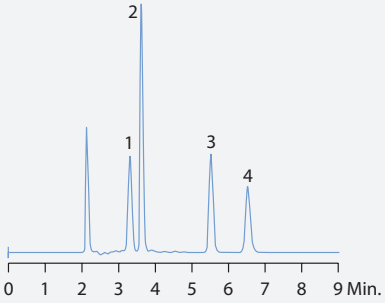
CHROM 8774

Column: Adsorbosphere® C8 column, 5µm, 250 x 4.6mm
Mobile Phase: **A**: Water **B**: Methanol
Gradient:

Time:	0	25
%B:	40	80

Flowrate: 1.0mL/min
Detector: ELSD

Aminoglycoside Antiobiotics

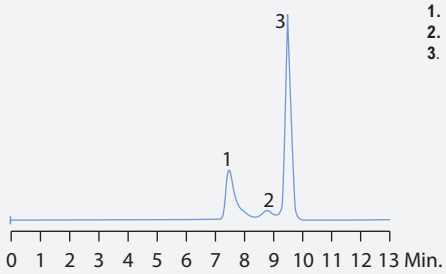


CHROM 9210

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

Column: Alltima™ C18 column, 5µm, 250 x 4.6mm
Mobile Phase: 0.3% Pentafluoropropionic Acid in Methanol: 0.3% Pentafluoropropionic Acid in 43.7mM Ammonium Formate, pH 2.7 (55:45)
Flowrate: 1.0mL/min
Detector: ELSD

Polydimethyl Siloxane



CHROM 10219

1. Reaction Product
2. Linear Polymer
3. Cyclic Polymer

Column: Jordi DVB Organic GPC
Mobile Phase: Chloroform:Acetonitrile (60:40)
Flowrate: 1.5mL/min
Detector: ELSD

Ordering Information

Alltech® 3300 ELSD	
Description	**Part No.**
3300 ELSD 110V – 240V	**5135834**

Services for the Alltech® 3300 ELSD	
Description	**Part No.**
Installation and Training	**INSTALL**
Qualification	
IQ/OQ at Customer Site	**Q330010**
PQ at Customer Site	**Q330020**
IQ/OQ/PQ at Customer Site	**Q330030**

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Alltech® 3300 ELSD Specifications	
Light Source:	Laser diode with collimating optics, 650nm, 30mW output, class IIIB
Detector Element:	Silicon photodiode
Temperature Range:	Ambient to 120ºC in 1ºC increments
Nebulizer Gas:	Nitrogen preferred; Calibrated to 4.0L/min
Inlet Pressure:	60 – 80psig
Typical Operating Range:	1.0 – 2.0L/min
Flow Control:	Digital Mass Flow Control
Mobile Phase Flow Rate:	To 3.0mL/min
Analog Output:	1V or 10mV full scale
Communications:	*Inputs*: TTL/contact closure for auto zero, gas shutoff, start, and standby *Outputs*: Contact Closure for pump shutdown in error conditions, general events *Data Ports*: USB, RS232, Ethernet
User Interface:	Full color Microsoft Windows® based Graphical LCD with alphanumeric keypad
Power Requirements:	120/240V, 50/60Hz
Dimensions:	11.6" H x 10.3" W x 19.5" D (29.5cm H x 26.2cm W x 49.5cm D)
Weight:	30lbs (16Kg)
IEC/FDA Classification:	Class 1 Laser Product; Complies with 21 CFR Subpart J
Manufacturing Standards:	Meets all applicable safety and EMC certifications; CE, UL, and CSA certified
Warranty:	1 year parts and labor

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