

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

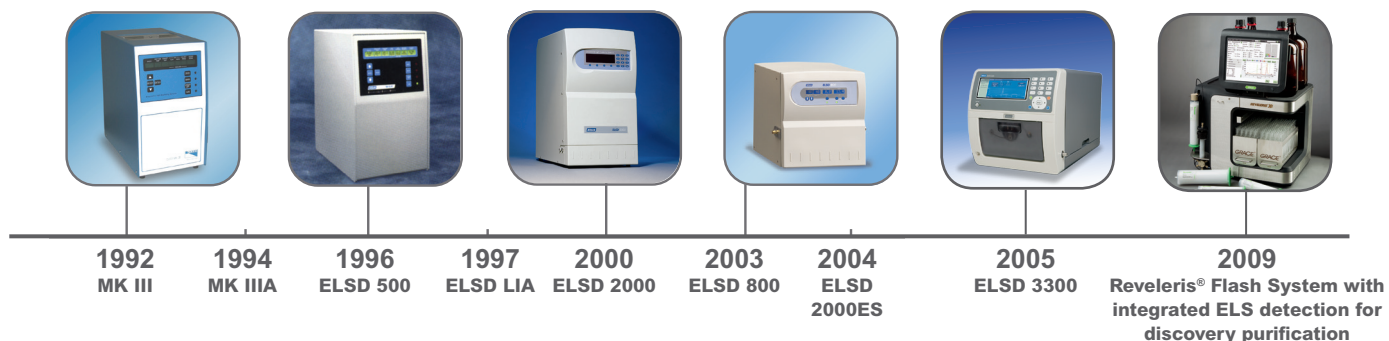
Materials Technologies

Discovery Sciences

Introduction To ELSD

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

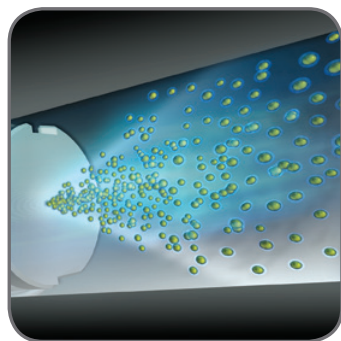
Gradient Compatible

- Maintain stable baselines during steep gradients

Alltech® ELSDs simplify analysis of difficult compounds:

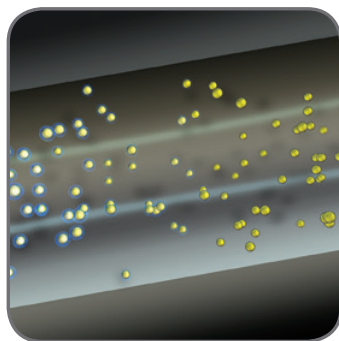
- pharmaceuticals
- impurities
- phospholipids
- fatty acids
- surfactants
- nutraceuticals
- excipients
- amino acids
- triglycerides
- polymers
- carbohydrates
- peptides

ELSD Detection Process:



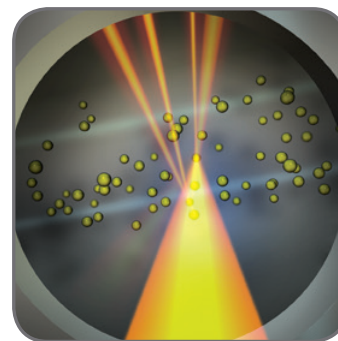
1. Nebulization

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.

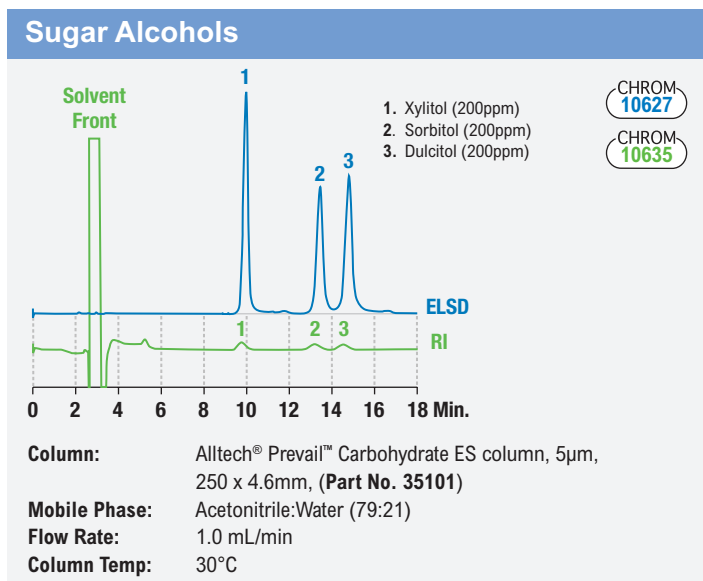
ELSD Advantages

ELSD Advantages Over Other LC Detectors

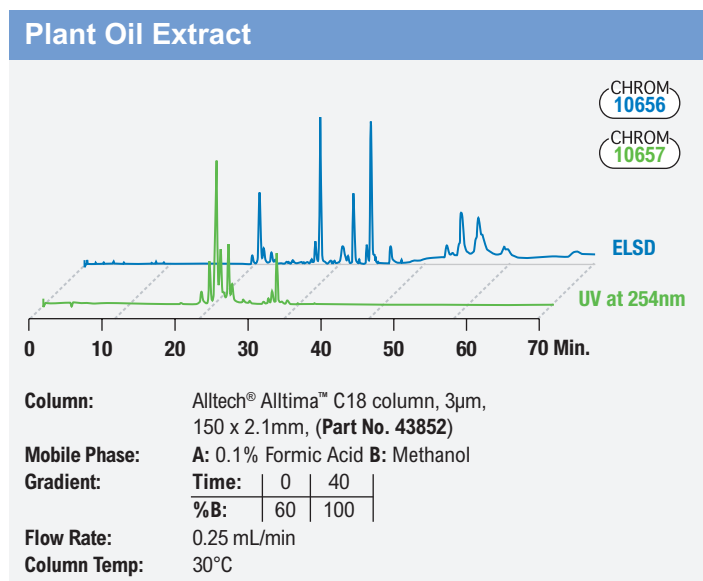
	ELSD	RI	UV	MS
Sensitivity	●	○	●	●
Gradient Capability	●	○	●	●
Baseline Stability	●	○	●	●
Solvent Interference	●	○	○	●
Mass Balance	●	●	○	○

CHART KEY	
Excellent:	●
Good:	○
Poor:	○

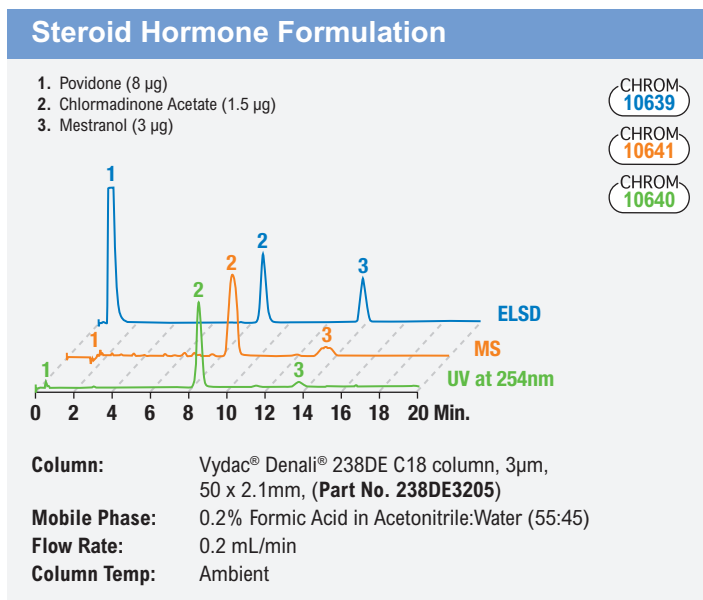
ELSD improves baseline stability and detection sensitivity compared to refractive index (RI)



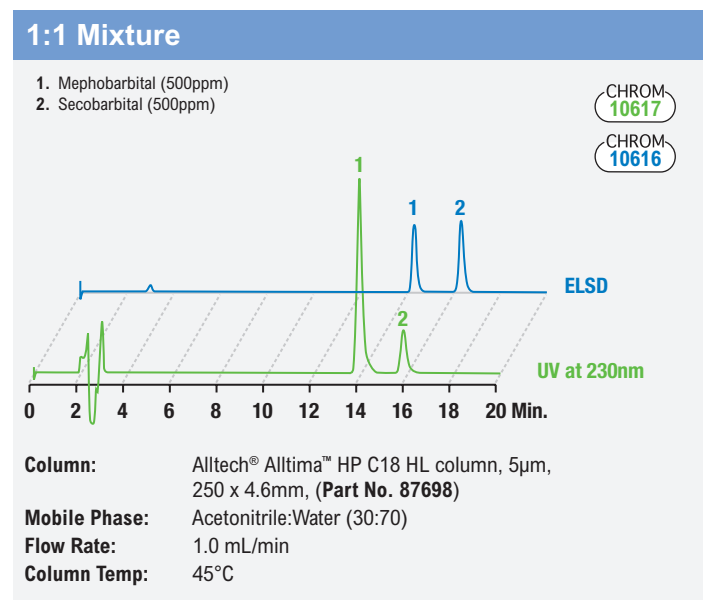
ELSD shows what may be missing from your UV chromatogram



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



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



Sensitive & Reproducible

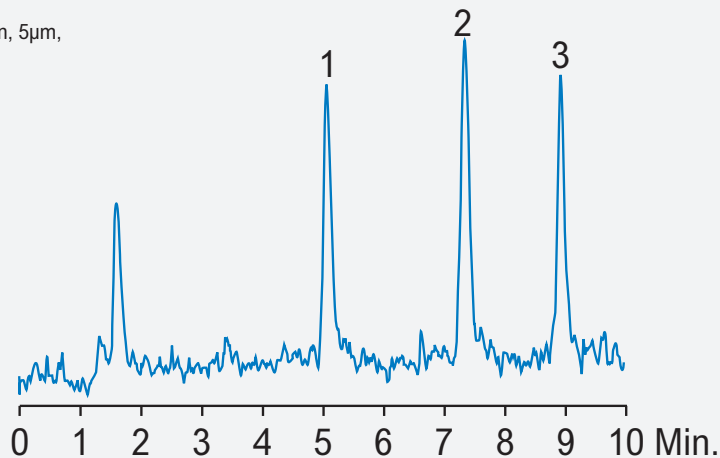
Low noise and excellent baseline stability allows detection limits in the low nanogram range

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

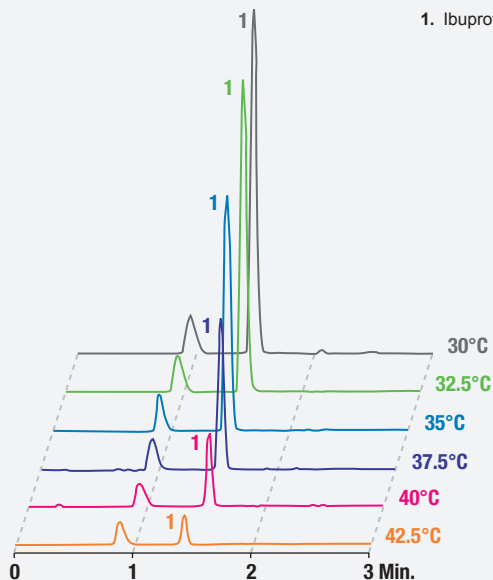
CHROM
10498

1. Fructose
2. Sucrose
3. Raffinose



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

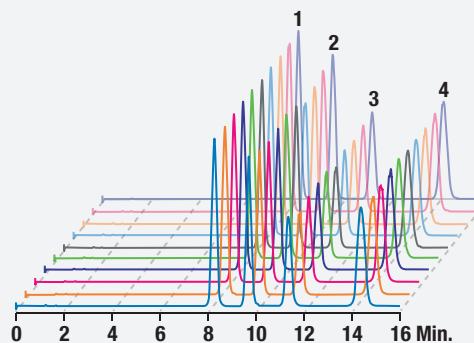
1. Ibuprofen (100ppm)



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

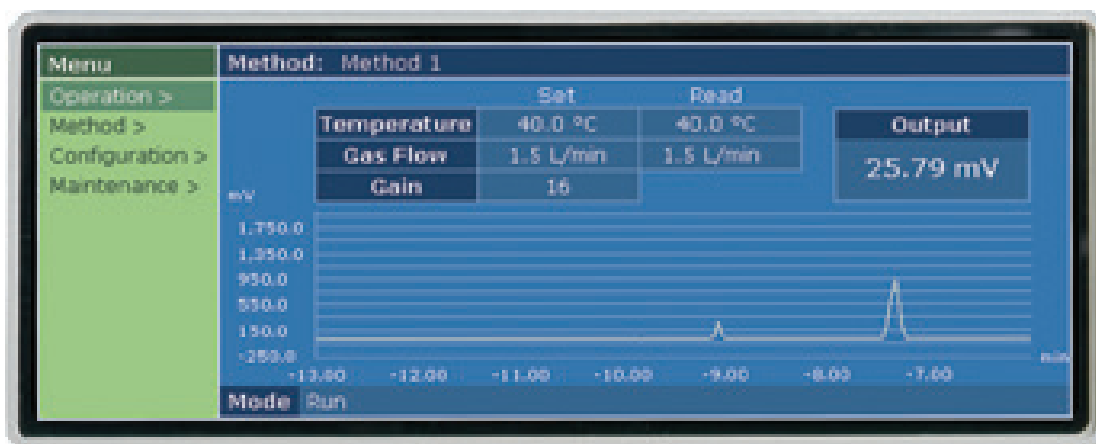
The 3300 ELSD is very REPRODUCIBLE as demonstrated by 10 identical injections of four ginkgolide components

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

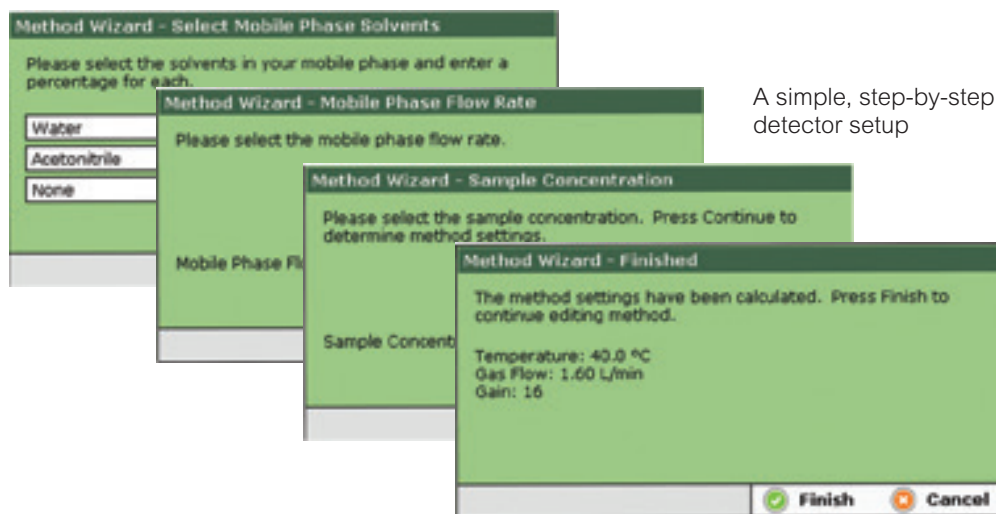


Column: Alltech® Platinum™ C18 column, 5µm, 250 x 4.6mm, (Part No. 32064)
Mobile Phase: Water:Methanol:THF (65:25:10)
Flow Rate: 1.0 mL/min
Column Temp: Ambient

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
- Italiano
- Español
- Japanese
- Français
- Chinese
- Deutsch



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

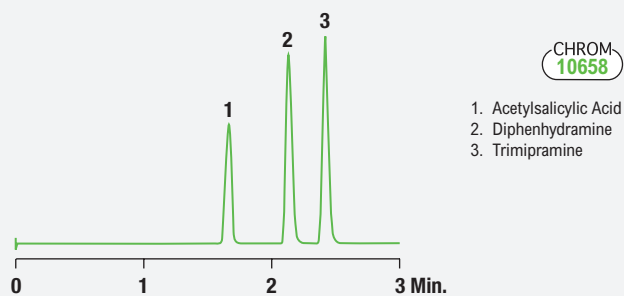
Full IQ/OQ/PQ Protocols Available

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

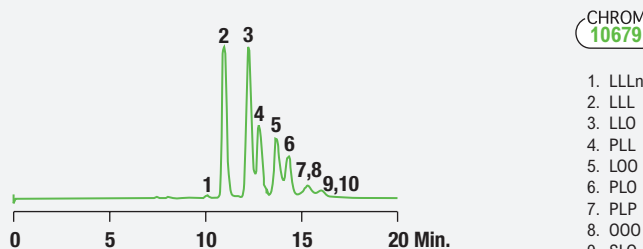
Gradient:

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

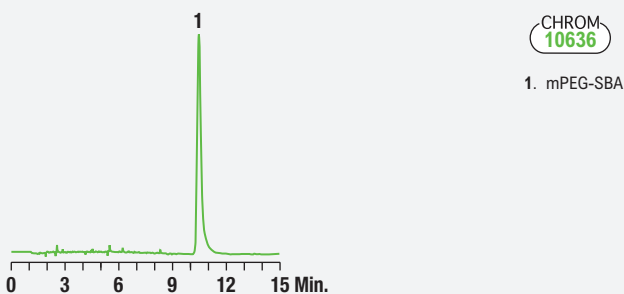
Gradient:

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

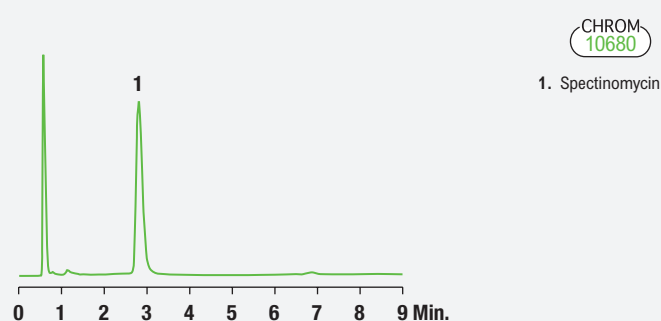
Gradient:

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

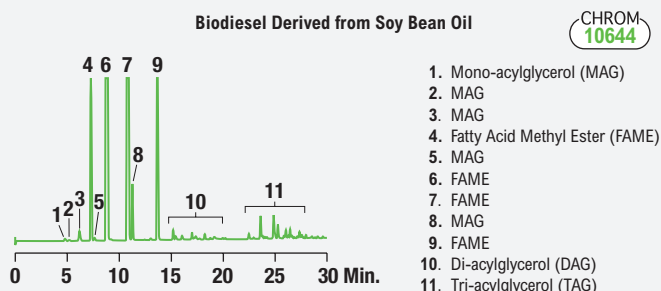
Column: Alltech® Alltima™ HP C18 Amide column, 3µm, 50 x 4.6mm, (Part No. 87829)

Mobile Phase: 10mM Ammonium Carbonate:Acetonitrile (98:2)

Flow Rate: 1.0 mL/min

Column Temp: Ambient

Detect Difficult Samples without Derivatizing



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

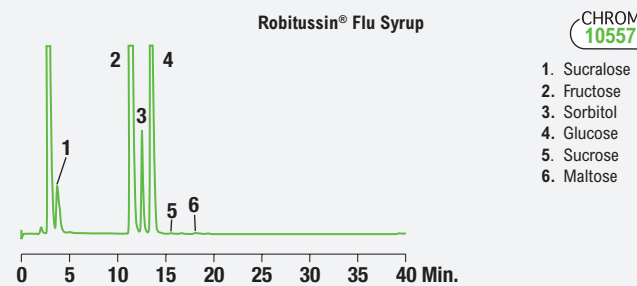
Gradient:

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



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

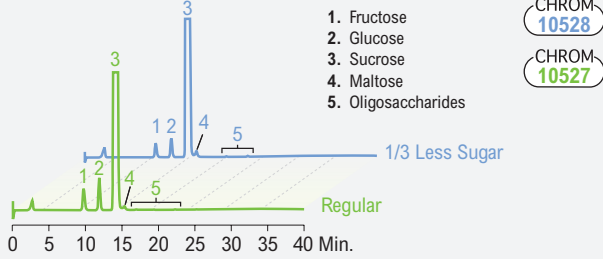
Flow Rate: 1.0 mL/min

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

Column: Prevail™ Carbohydrate ES Column, 5µm, 250 x 4.6mm, (Part No. 35101)

Mobile Phase: A: Acetonitrile B: Water

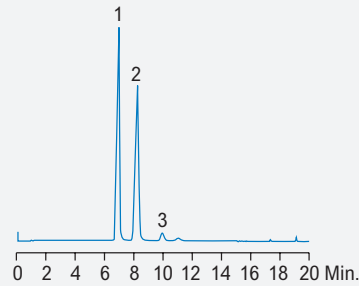
Gradient:	Time:	0	5	10	15	25
	%B:	20	20	30	30	50

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

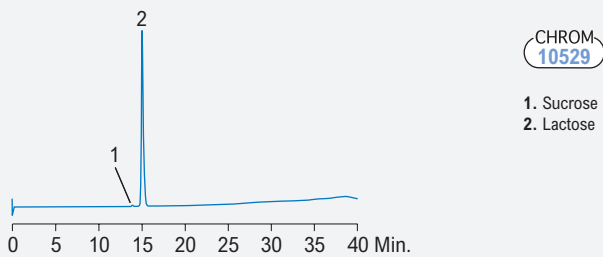
Gradient:	Time:	0	15
	%B:	25	40

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

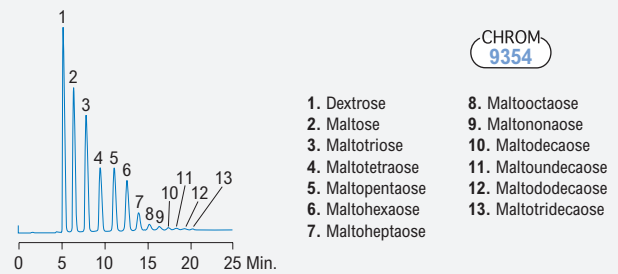
Gradient:	Time:	0	5	10	15	25
	%B:	20	20	30	30	50

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

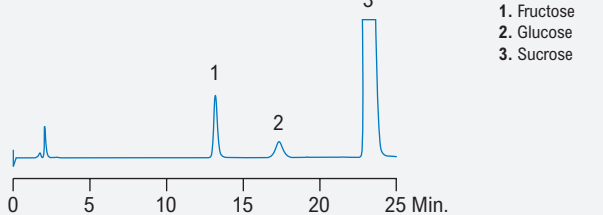
Flow Rate: 1.0mL/min

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

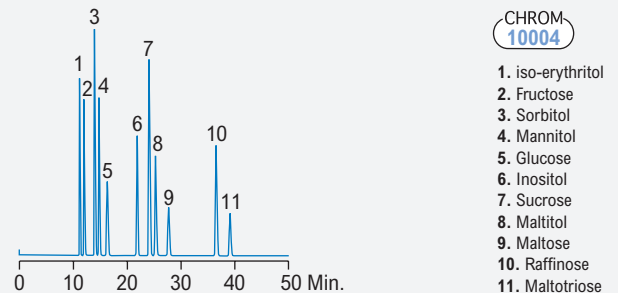
Gradient:	Time:	0	30
	%B:	20	29

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% NH₄OH

Gradient:	Time:	0	60
	%B:	17	35

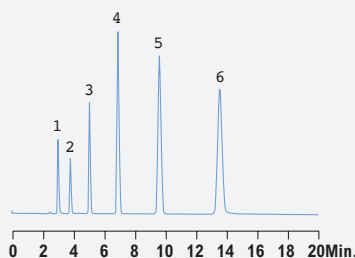
Flow Rate: 1.0mL/min

Detector: ELSD

Column Temp: Ambient

ELSD Applications

Underivatized Fatty Acids

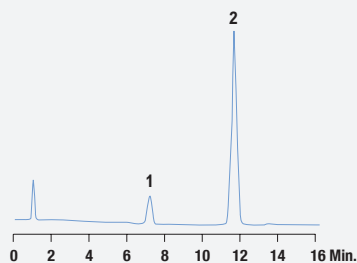


CHROM
9539

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: Acetonitrile:Methanol (75:25)
Flow Rate: 1.0mL/min
Detector: ELSD

Egg Yolk Phospholipids



CHROM
10214

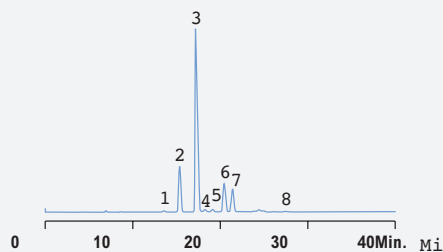
1. Phosphatidylethanolamine
2. Phosphatidylcholine

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

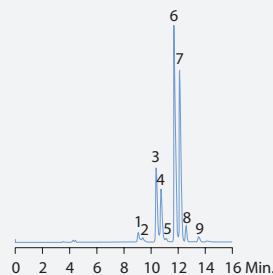
1. LGG
2. LGL
3. LLL
4. OGL
5. PGL
6. OLL
7. OGO + PLL
8. OOO

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

Tryglicerides in Olive Oil



CHROM
9515

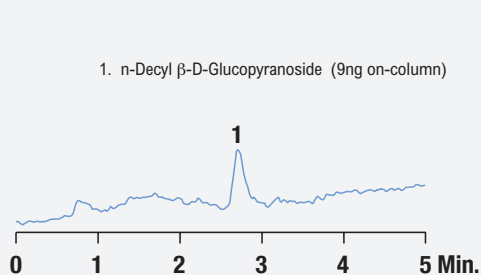
1. LLO
2. LLP
3. OOL
4. POL
5. PPL
6. OOO
7. OOP
8. PPO
9. OOS

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)

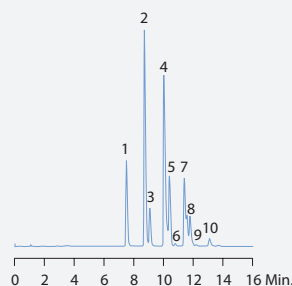


CHROM
10225

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

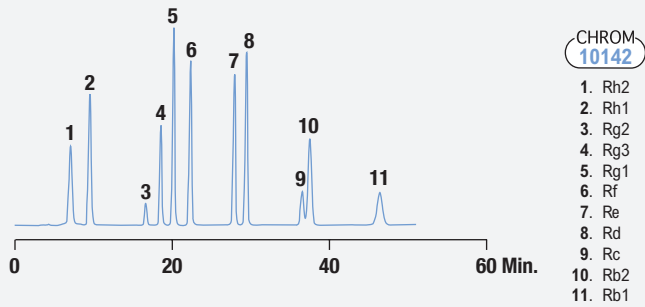
Column: Alltima™ C18 column, 3µm, 150 x 4.6 mm
Mobile Phase: A:Dichloromethane B:Acetonitrile
Gradient:

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

Flowrate: 1.0mL/min
Detector: ELSD

ELSD Applications

Separation of Ginsenosides in Korean Ginseng

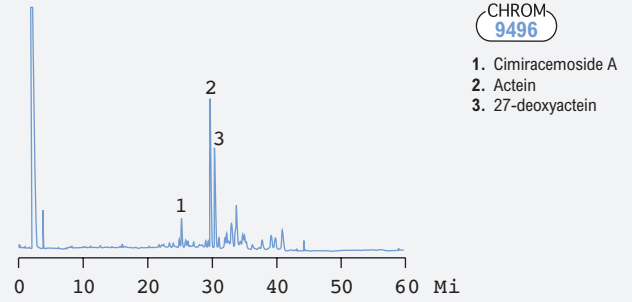


Column: Prevail™ Carbohydrate ES column, 5µm, 250 x 4.6mm
Mobile Phase: A: Acetonitrile:Water:Isopropyl Alcohol (80:5:15)
 B: Acetonitrile:Water:Isopropyl Alcohol (67:21:12)
Gradient:

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

Flowrate: 0.8mL/min
Detector: ELSD

Black Cohosh

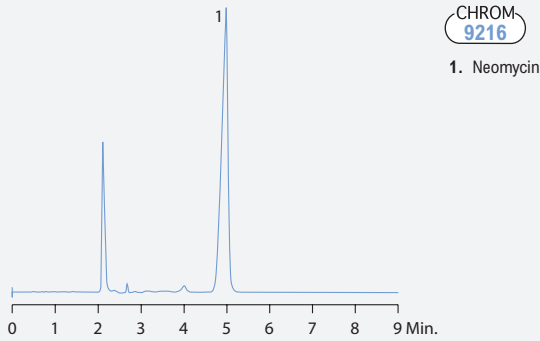


Column: Prevail™ C18 column, 5µm, 250 x 4.6mm
Mobile Phase: A: 1% Formic Acid B: ACN
Gradient:

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

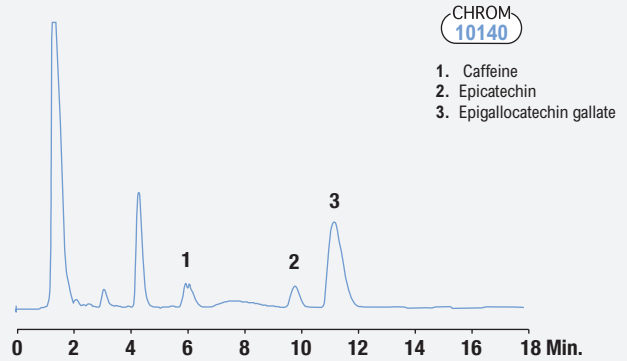
Flowrate: 1mL/min
Detector: ELSD

Neomycin Extracted from Neo-Cinolone Cream



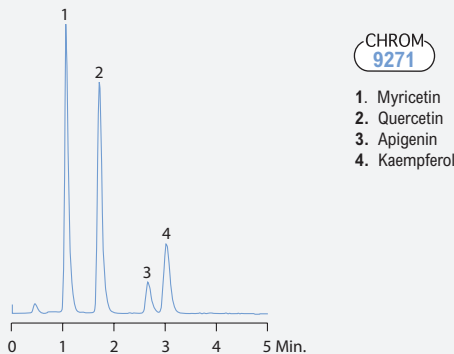
Column: Alltima™ C18 column, 5µm, 250 x 4.6mm
Mobile Phase: 0.3% Pentafluoropropionic Acid in Methanol:
 0.3% Pentafluoropropionic Acid in 43.4mM Ammonium Formate, pH 2.6 (55:45)
Flowrate: 1.0mL/min
Detector: ELSD

Catechins in Green Tea - Prep Scale



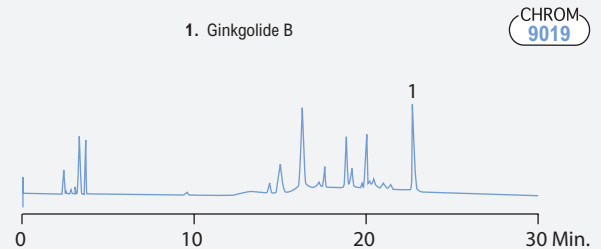
Column: Alltima™ C18 column, 5µm, 150 x 22mm
Mobile Phase: 0.05% TFA:Acetonitrile (87:13)
Flowrate: 23mL/min
Detector: ELSD

Flavonoids



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



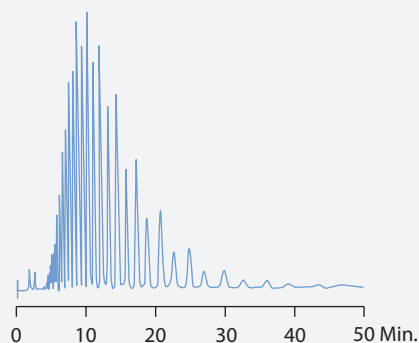
Column: Adsorbosphere® C8 column, 5µm, 250 x 4.6mm
Mobile Phase: A: 5% Acetonitrile in 0.1% TFA
 B: 70% Acetonitrile in 0.1% TFA
Gradient:

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

Flowrate: 1.0mL/min
Detector: ELSD

ELSD Applications

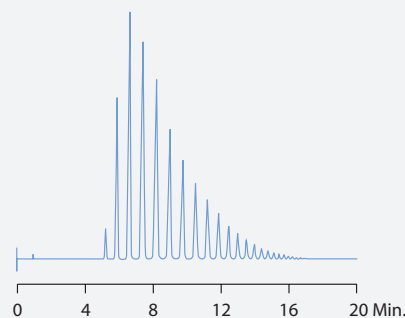
Tween 80



CHROM-9017

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

Dimethicone



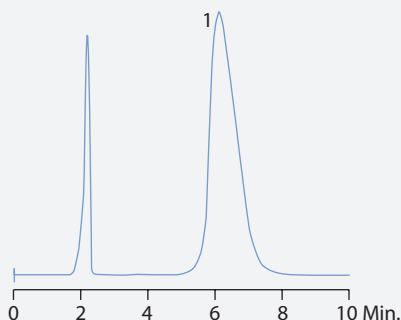
CHROM-8636

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

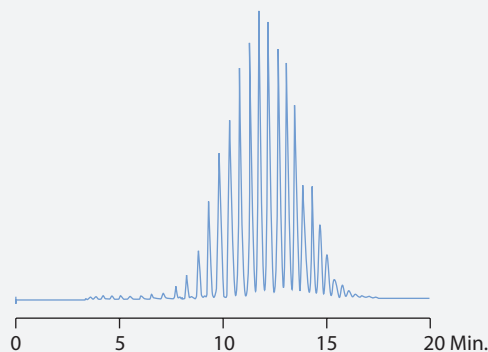
1. PEG

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



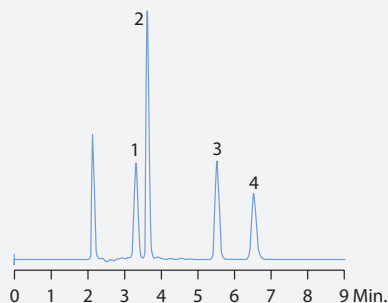
CHROM-8774

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 Antibiotics

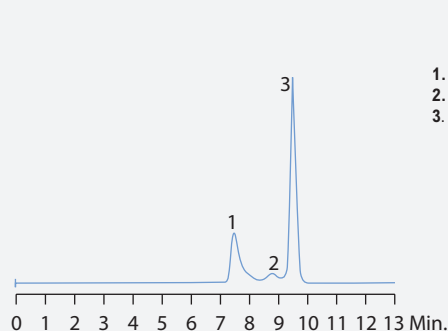


CHROM-9210

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 3300 ELSD 110V – 240V	PART No. 5135834

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

Did you know... Grace was the first company to introduce an advanced flash chromatography system with integrated ELS detection? The **Reveleris® X2 Flash Chromatography System** with multiple patented technologies, detects both chromophoric and



non-chromophoric target compounds and impurities, allowing users to see everything in your sample. This advanced flash chromatography system helps chemists improve purity of target molecules and increase productivity.

Contact your Grace Representative or visit www.Reveleris.com for more information.

Alltech® 3300 ELSD Specifications	
Light Source:	Laser diode with collimating optics, 650nm, 30mW output, class IIIB
Detector Element:	Silicon photodiode
Temperature Range:	Ambient to 120°C in 1°C 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:	<i>Inputs:</i> TTL/contact closure for auto zero, gas shutoff, start, and standby <i>Outputs:</i> Contact Closure for pump shutdown in error conditions, general events <i>Data Ports:</i> 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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Global Headquarters

W. R. Grace & Co.-Conn
7500 Grace Drive
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Contact us today for more information

Australia

Rowville
Tel: +61 3.9237.6100
discoverysciences.AU@grace.com

China

Shanghai
Tel: +86 21.5467.4678
dsbiz.asia@grace.com

India

Pune
Tel: +91 20.6644.9900
pune@grace.com

Latin America

Sorocaba, Brazil
Tel: +55 15.3235.4705
discoverysciences.BR@grace.com

Europe

Lokeren, Belgium
Tel: +32 (0)9.340.65.65
discoverysciences.EU@grace.com

North America

Deerfield, Illinois
Tel: +1 847.948.8600
discoverysciences@grace.com

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