



ThermoFisher
S C I E N T I F I C

New Ion Chromatography HPIC Systems : What's Inside Matters

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ACO EMEA Sales Manager (IC and SP)

The world leader in serving science

Agenda

- Thermo Scientific Dionex Ion Chromatography Product Line
- New IC systems
 - Aquion
 - Integrion
 - Integrion configurations
 - Integrion performance
- 4 μ m Columns Available for HPIC Systems
- Applications

The Thermo Scientific Dionex Ion Chromatography Product Line

RFIC

HPIC



Dionex Aquion



Dionex Integrion



Dionex ICS-4000



Dionex ICS-5000⁺



Dionex IC Autosamplers

Thermo Scientific Dionex AS-DV Autosampler



Entry Level

- Carousel Type
- 50 x 5 mL PolyVials
- 50 x 0.5 mL PolyVials
- Filter Caps
- Full Loop, Concentrator
- Simultaneous Injection
- Optional 6-port/10-port Valve

Thermo Scientific Dionex AS-HV Autosampler



High Volume

- X0Z-Type
- 24 x 250 mL TCF
- 15 x 250 mL Bottles
- Full Loop Injection, Concentrator Loading
- Simultaneous Injection
- Peristaltic Pump for sample loading and Needle Port Rinse

Thermo Scientific Dionex AS-AP Autosampler



For IC, BioIC, and Cap IC

- Carousel-Type
- 81 x 10 mL Vials
- 120 x 1.5 mL or 0.3 mL Vials
- 3 x 96 Well Plates
- 3 x 384 Well Plates
- Full/Partial Loop, Limited Sample, Concentrator Loading
- Push and Pull Loop injection
- Tray Thermostat
- Optional Injection Valve
- Optional Diverter Valve
- Optional Fractionation valve
- Sequential Injection
- Simultaneous Injection
- Autodilution

Dionex Aquion

Anion and Cation capability to ppb levels

Dionex ERS Electrolytic suppressors

- No regenerant needed
- No additional peristaltic pump

Column Heater: field upgradeable option

Piston seal wash (external pump req'd)

Optional degas

Eluent shut-off valve

Sample prep

- AutoDilution
- Sample pre-concentration
- Matrix elimination
- In-line filtration



Dionex Integrion – No Detector



Intended for the Following Applications:

IC-UV applications

- Bromate
- Transition Metals
- Cr(VI)
- Silicate

IC-ICP-MS applications

- Cr speciation
- Hg speciation

Upgrading

The following are field upgradable:

- Eluent degasser
- Detector
- Column oven with RFID
- RFIC-EG
- Electrolytic device channels (max. 5)

Dionex Integrion – Conductivity Detector



Intended for the Following Applications:

Isocratic IC applications

- Manually prepared carbonate/ bicarbonate mixtures
 - EPA 300.1
- Manually prepared sulfuric acid
- Manually prepared methane sulfonic acid (MSA)
- Or any other manually prepared eluents compatible with PEEK

Upgrading

The following are field upgradable:

- Eluent degasser
- Column oven with RFID
- RFIC-EG
- Electrolytic device channels (max. 5)

Dionex Integrion RFIC – Conductivity Detector



Intended for the Following Applications:

- RFIC applications (Isocratic & gradient)
- Trace analysis
- IC-MS applications

Upgrading

- Electrolytic device channels (max. 5)

Dionex Integrion RFIC – Electrochemical Detector



Intended for the Following Applications:

Isocratic IC applications

- Mono- & di-saccharides (RFIC HPAE-PAD)
- Cyanide
- Iodide

Upgrading

- Electrolytic device channels (max. 5)

Summary of Upgradability

Upgradable

✓ **Detector**

✓ **Tablet**

✓ **Column Oven
with RFID**

✗ **Detector Compartment
Thermostat**

✓ **Electrolytic
Device Channels**

✓ **RFIC-EG**

✓ **Eluent Degasser**

✓ **Auxiliary Valve**

Positioning

	Dionex Aquion IC System	Dionex Integrion C HPIC System
Markets	<ul style="list-style-type: none">• Routine Water Labs• Routine Food Beverage Labs• Academia	<ul style="list-style-type: none">• Routine water labs• Routine Food Beverage Labs• High throughput contract laboratories
Samples per Week	<100	>100
Features	<ul style="list-style-type: none">• Limited upgradability (only oven)• Standard pressure (3000 psi)• No consumable tracking	<ul style="list-style-type: none">• Modular upgradability• High pressure (5000 psi)• Viper fittings standard• Consumable tracking• Installation and troubleshooting videos

Feature / Value

Feature	Value	Aquion	Integrion	ICS-4000	ICS-5000+
High Performance Pump	Consistent, accurate results	✓	✓	✓	✓
Electrolytically Regenerated Suppressor	Saves time and money	✓	✓	✓	✓
Sample Preparation	Labor, operational, and capital savings	✓	✓		✓
Eluent Generation – just add water	Increased throughput, operational savings		✓	✓	✓
Gradient Separations	Saves time and labor		✓	✓	✓
Integrated Electrochemical Cell	Capital savings, expand lab capabilities		✓	✓	✓
QD Charge Detection	Expanded capabilities			✓	
High Pressure IC up to 5000 psi	Increased throughput, expanded capabilities		✓	✓	✓
Capillary IC Capability	Operational savings, expanded capabilities			✓	✓
Modularity	Capital savings				✓
Configurable as Independent Dual System	Capital savings				✓
Proportioned Mechanical Gradients	Expanded capabilities				✓
2-D Chromatography	Expanded capabilities				✓

Dionex Integrion HPIC System Performance : Major Benefits

Dionex
Integrion



Accurate eluent preparation

Sensitive results with pure, uncontaminated eluent

Improves analytical reproducibility

Run both isocratic and gradient separations

Reduces pump maintenance

Reduced exposure to hazardous chemicals

Dionex RFIC-EG Systems — Just Add Water

Dionex

EGC Cartridges

Generate eluents on-line using deionized water as the carrier



Simplified System Operation

- 1 Install the eluent generator
- 2 Attach a source of deionized water to your pump
- 3 Collect data

IC PEEK Viper Fittings

100% metal free flow path

Finger tight operation

One-handed connections



Consistent low (virtually zero) dead volume connections

IC PEEK Viper Fittings

Available as kits for Integrion systems

- Pre-cut for optimum path-length and dead-volume minimization
- Kits also available for ICS-4000 and ICS-5000+ systems

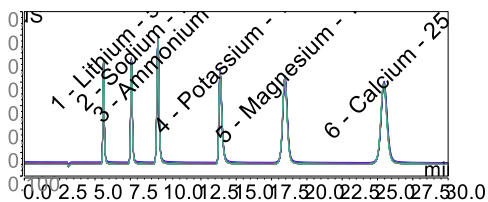
Viper lines and fittings are pre-cut and pre-molded

- No trimming or complicated cutting required
- Fittings cannot fall off the end of the line

1/32nd inch o.d. tubing is tested to hold 6,000 psi

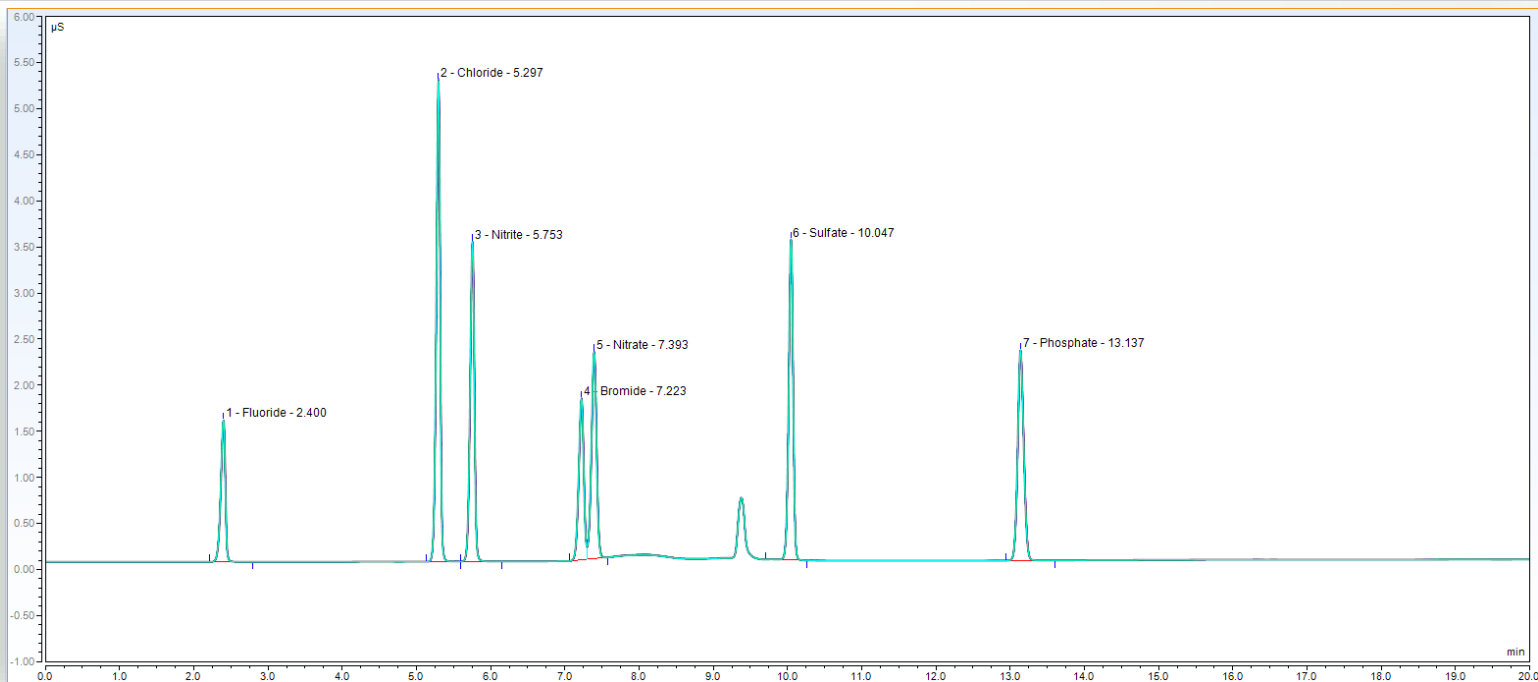
- Half the o.d. as our standard 1/16th inch tubing
- Same i.d. and pressure rating
- Available up to 0.010" (0.25 mm)

CS16 4 μm 4mm Isocratic Reproducibility (n=30)



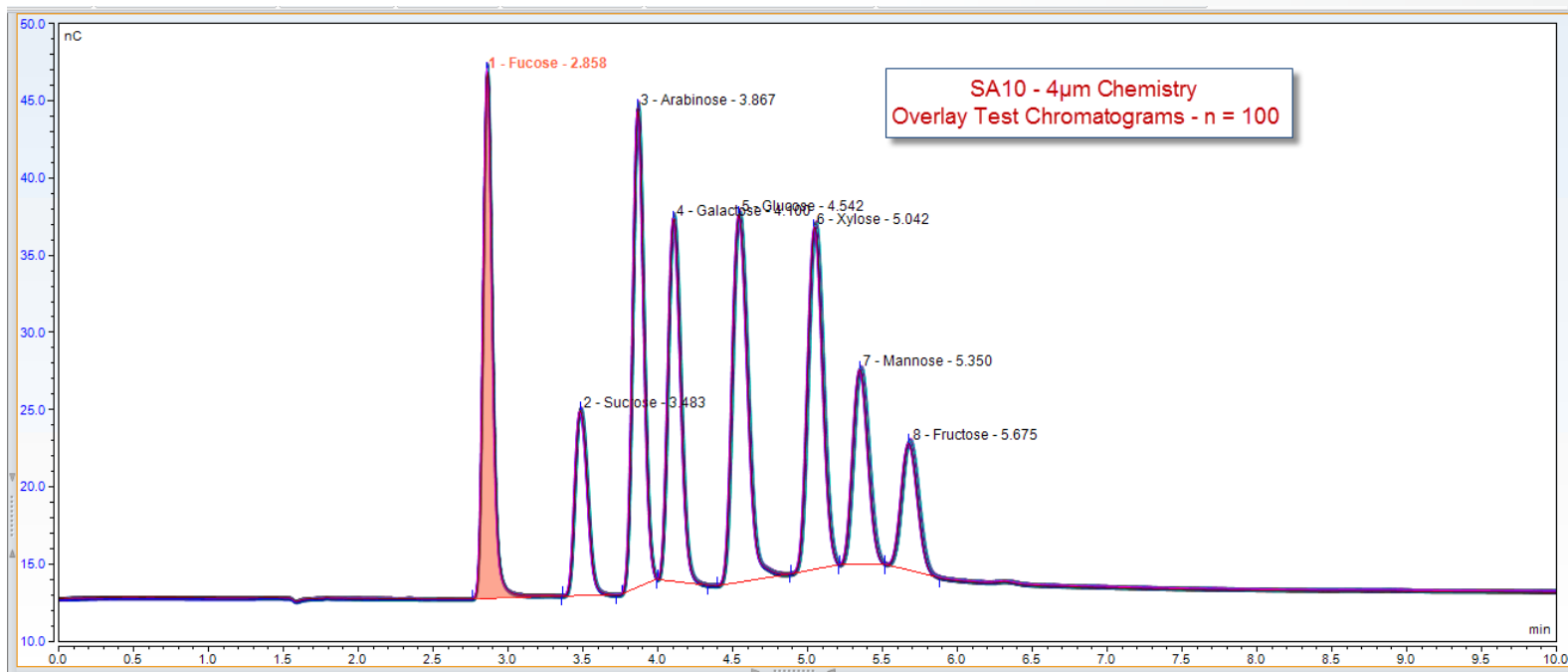
	Lithium	Sodium	Ammonium	Potassium	Magnesium	Calcium
Area (μS·min)	0.0520	0.0655	0.1048	0.1039	0.1475	0.1837
% RSD Area	0.201	0.183	0.203	0.220	0.292	0.079
Ret. Time (min)	5.607	7.579	9.455	13.856	18.443	25.447
%RSD Ret.	0.032	0.031	0.034	0.049	0.041	0.053

AS11 4mm Gradient Reproducibility (n=30)



	Fluoride	Chloride	Nitrite	Sulfate	Bromide	Nitrate	Phosphate
Area (µS·min)	0.110	0.324	0.236	0.137	0.242	0.182	0.217
% RSD Area	0.059	0.075	0.075	0.130	0.061	0.101	0.049
Ret. Time (min)	2.400	5.297	5.755	7.223	10.047	7.394	13.139
%RSD Ret.	0.060	0.020	0.029	0.021	0.014	0.023	0.022

SA10 4 μ m 2mm Reproducibility - Ag/AgCl (n=100)



	Fucose	Sucrose	Arabinose	Galactose	Glucose	Xylose	Mannose	Fructose
Area (nC·min)	2.512	1.188	2.694	2.336	2.875	2.615	1.516	1.071
% RSD Area	0.720	0.595	0.541	0.519	0.434	0.520	0.460	0.972
Ret. Time (min)	2.864	3.486	3.870	4.109	4.547	5.053	5.355	5.682
%RSD Ret.	0.141	0.112	0.104	0.081	0.101	0.099	0.095	0.094

Common Analysis Challenges



How Can High-Pressure IC Help?

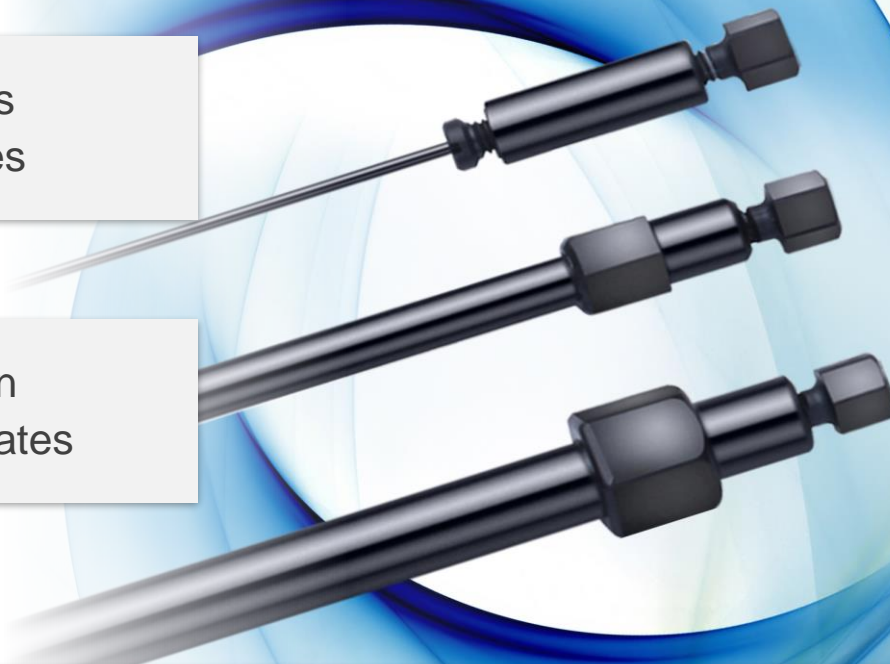
150mm

- Faster run times
- Higher flow rates

250mm

- Better resolution
- Standard flow rates

Achieving the optimal combination of speed and resolution



4µm Columns Available for Use in HPIC Systems

Anion (OH⁻ selective)

- Thermo Scientific™ Dionex™ IonPac™ AS11-HC-4µm column
- Dionex IonPac AS18-4µm column
- Dionex IonPac AS19-4µm column
- Dionex IonPac AS28-4µm column

Anion (CO₃²⁻ selective)

- Dionex IonPac AS22-Fast-4µm column

Cation

- Dionex IonPac CS16-4µm column
- Dionex IonPac CS16-Fast-4µm column
- Dionex IonPac CS19-4µm column

Carbohydrate

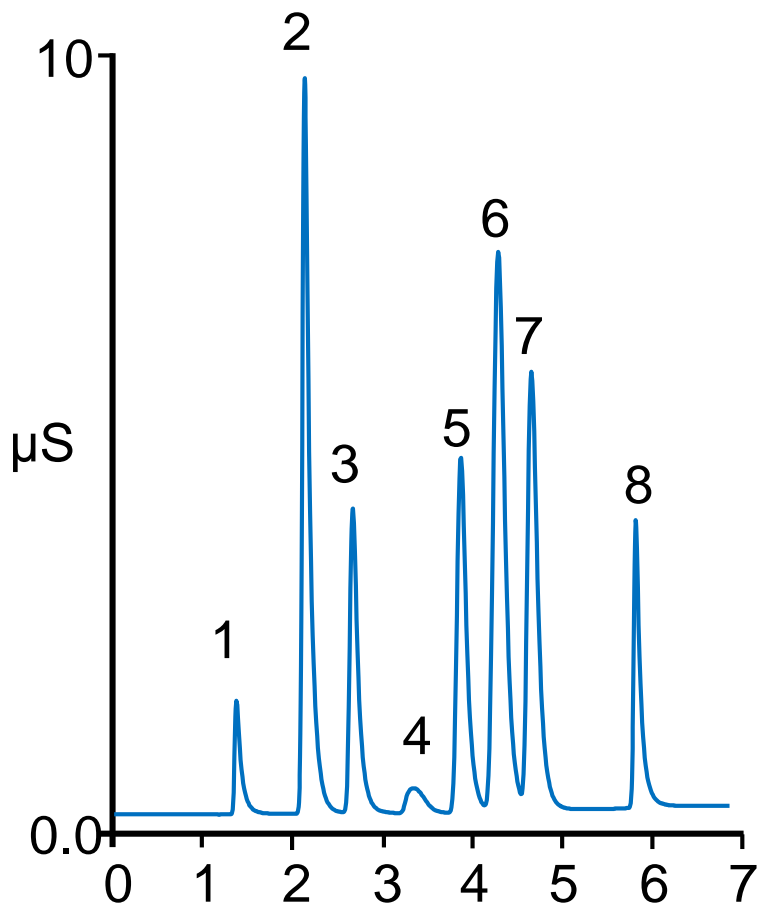
- Thermo Scientific™ Dionex™ CarboPac™ SA10-4µm column
- Dionex CarboPac SA10-Fast-4µm column

Smaller Particle Columns:

- ▶ Produce more efficient peaks
- ▶ Impact chromatographic speed and resolution
- ▶ Improve peak integration – more accurate and reliable results
- ▶ Increase sample throughput without compromising data quality
- ▶ Improve quality of analytical results



Fast Separations

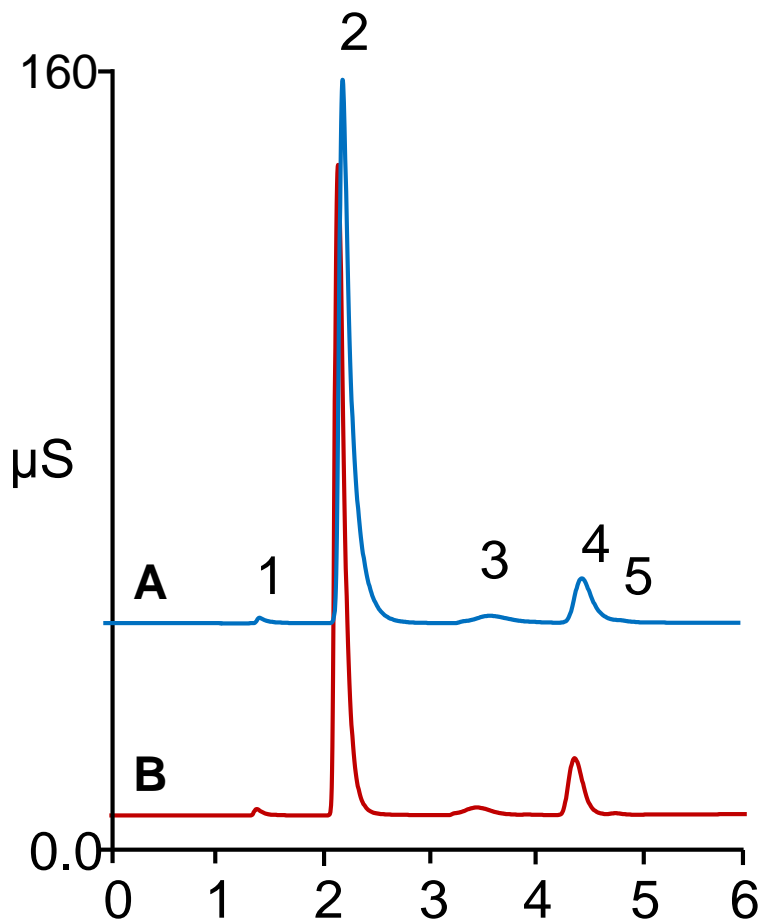


Column: Dionex IonPac AS18-Fast-4 μ m, 2 \times 150 mm
Gradient: 23.5–60 mM KOH from 3 to 4.7 min
Eluent Source: Dionex EGC 500 KOH cartridge,
Dionex CR-ATC 600 trap column
Flow Rate: 1.50 mL/min
Inj. Volume: 10 μ L
Column Temp.: 30 $^{\circ}$ C
Detection: Suppressed conductivity, Dionex AERS 500,
2 mm, 223 mA, recycle mode

Peaks:

1. Fluoride
2. Chloride
3. Nitrite
4. Carbonate
5. Bromide
6. Sulfate
7. Nitrate
8. Phosphate

Determination of Anions in Municipal Drinking Water



Column: A: Dionex IonPac AS18-Fast, 4 × 150 mm
B: Dionex IonPac AS18-Fast-4µm, 4 × 150 mm

Gradient: 23.5–60 mM KOH from 3 to 4.7 min

Eluent Source: Dionex EGC 500 KOH cartridge,
Dionex CR-ATC 600 trap column

Flow Rate: 1.50 mL/min

Inj. Volume: 10 µL

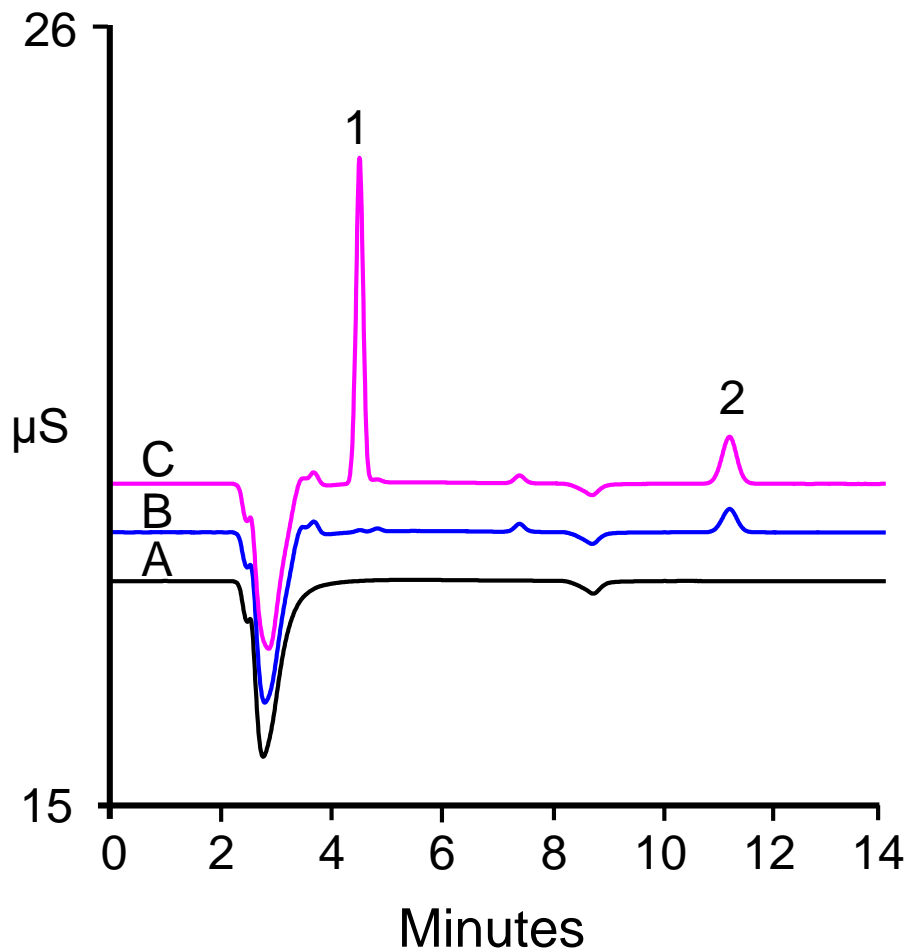
Column Temp.: 30 ° C

Detection: Suppressed conductivity, Dionex AERS 500,
2 mm, 223 mA, recycle mode

Sample: Municipal City drinking water

Peaks: 1. Fluoride
2. Chloride
3. Carbonate
4. Sulfate
5. Nitrate

Chloride and Sulfate in Denatured Ethanol Samples



Column: Dionex IonPac AG22-Fast-4µm
Dionex IonPac AS22-Fast-4µm,
4 × 150 mm

Eluent: 4.5 mM Sodium Carbonate
1.4 mM Sodium Bicarbonate

Flow Rate: 1.2 mL/min

Inj. Volume: 25 µL

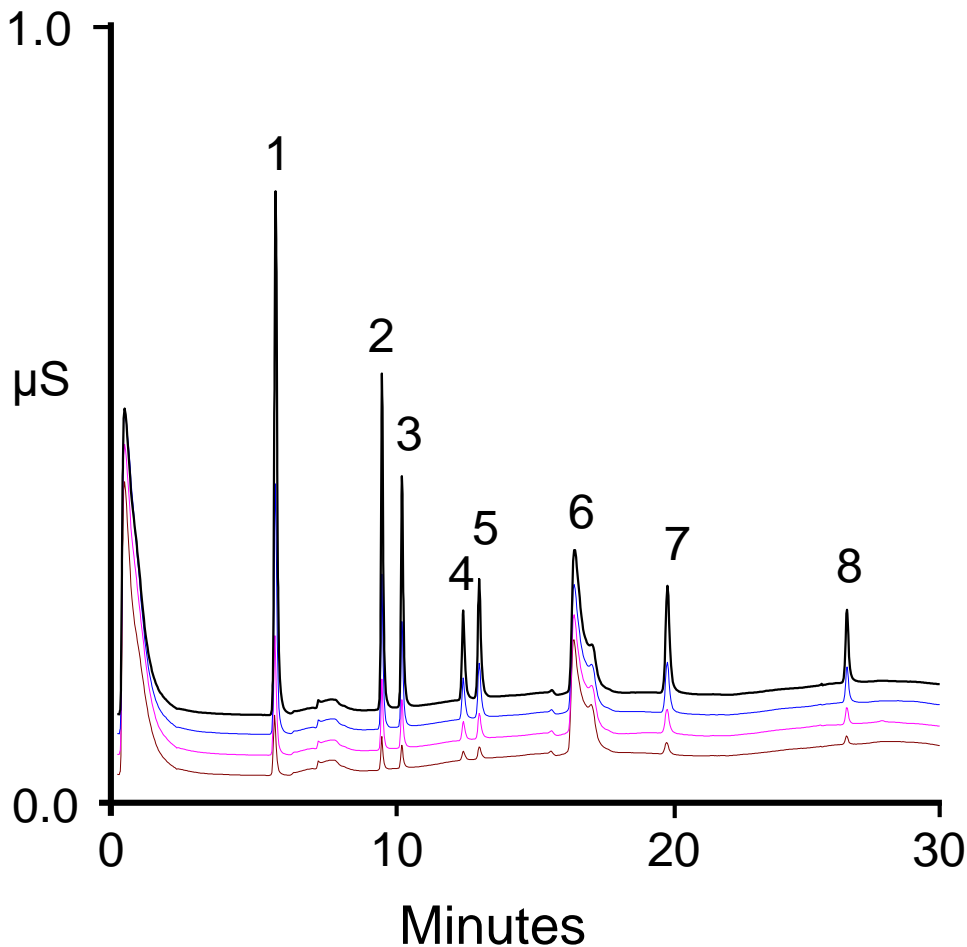
Column Temp.: 30 ° C

Detection: Suppressed conductivity,
Dionex AERS 500 Carbonate, 4 mm,
40 mA, recycle mode

Samples: A: Denatured reagent ethanol
B: Denatured ethanol sample
C: Sample B with 5 mg/L chloride
and 1 mg/L sulfate

Peaks:	A	B	C
1. Chloride	--	--	6.6 mg/L
2. Sulfate	--	0.90	1.8

Trace Analysis Using Inline Degassing, AutoPrep, and EWP

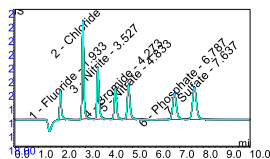


Columns: Dionex IonPac AS17-C set, 4 mm i.d.
KOH Gradient: 50 mM wash (4.5 min); 1 mM (-7 to 4 min), 1–12.5 mM (4–10 min); 12.5–20 mM (10–20 min); 20–35 mM (20–30 min)
Eluent Source: Dionex EGC 500 cartridge, CR-ATC 600 trap, high pressure degasser
Flow Rate: 1 mL/min
Column Temp.: 30 °C
Detection: Suppressed conductivity, Dionex AERS 500e, 4 mm, 87 mA, external water mode
Sample Prep.: Dionex CRD 300 inline degassing, Dionex AutoPrep, EWP, 30 mA
Concentrator: Dionex UTAC-LP2, 4 mm
Sample Vol.: Sample (10 mL), Standard (10–80 µL)
Standards: 50, 100, 200, 400 ng/L (ppt)
Autosampler: Dionex AS-HV High Volume

Peaks:

- | | |
|-------------|--------------|
| 1. Fluoride | 5. Nitrate |
| 2. Chloride | 6. Carbonate |
| 3. Nitrite | 7. Sulfate |
| 4. Bromide | 8. Phosphate |

AS22 Fast 4 μ m 4mm Isocratic Reproducibility

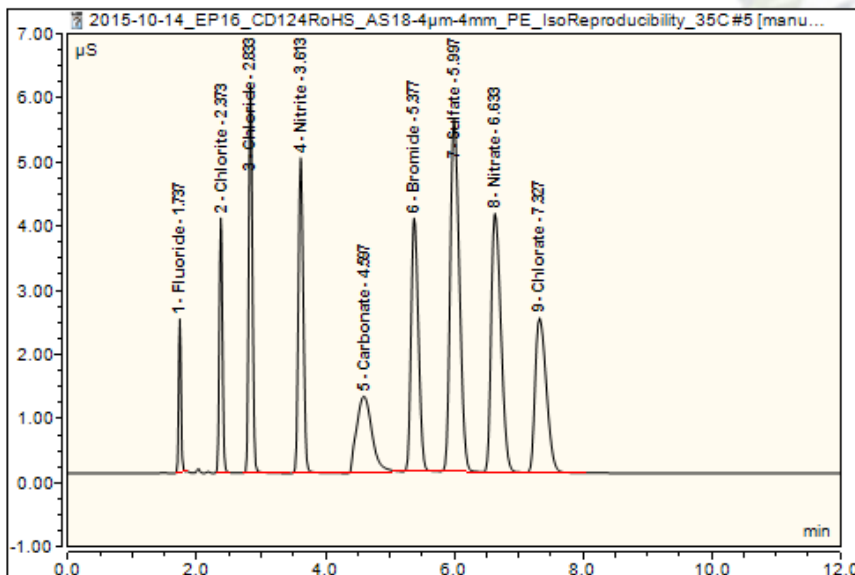


CD_Total	Fluoride	Chloride	Nitrite	Bromide	Sulfate	Nitrate	Phosphate
Peak Area (μ S*min)	0.091	0.305	0.200	0.132	0.230	0.167	0.175
% RSD Peak Area Spec. < 0.50	0.221 %	0.115 %	0.164 %	0.130 %	0.220 %	0.113 %	0.235 %
Peak Retention Time (min)	1.933	2.893	3.528	4.272	7.635	4.833	6.787
%RSD Peak Ret. Spec. < 0.10	0.000 %	0.000 %	0.047 %	0.043 %	0.021 %	0.046 %	0.033 %

AS18 4 μ m 4mm Peak Efficiency

Peak Analysis Repo

Sample Name: EP16_CD124RoHS_AS18-4 μ m Inj. Vol.: 10.0
 Sample Type: Unknown Dil. Factor: 1.0000
 Program: AS18-4 μ m-4mm-12Mins No. Operator: n.a.
 Inj. Date/Time: 14 Oct 15 Run Time: 12.00



No.	Time min	Peak Name	Width min	Height μ S	Resol. (USP)	Resol. (EP)	Plates (USP)	Plates (EP)	Asymmetry
1	1.737	Fluoride	0.067	2.388	8.083	8.155	10731	10826	1.082
2	2.373	Chlorite	0.090	3.967	4.687	4.736	11009	11178	1.084
3	2.833	Chloride	0.106	6.044	6.300	6.326	11472	11653	1.120
4	3.613	Nitrite	0.142	4.912	3.395	3.375	10387	10322	1.126
5	4.597	Carbonate	0.438	1.192	2.400	2.389	1766	1731	1.327
6	5.377	Bromide	0.213	3.945	2.606	2.597	10236	10213	1.247
7	5.997	Sulfate	0.263	5.484	2.352	2.324	8300	8135	1.263
8	6.633	Nitrate	0.278	4.029	2.323	2.278	9100	8759	1.385
9	7.327	Chlorate	0.319	2.409	n.a.	n.a.	8452	8034	1.400
		AVERAGE	0.213	3.819	4.018	4.022	9.050	8.983	1.226

Column AS18-4 μ m-4mm S/N 001082

Ret. Time min	Plates (EP)	Asymmetry	%Difference (EP)	%Difference (Ret.T)
1.77	5716	1.9	89.40%	-1.88%
2.40	8425	1.5	32.68%	-1.11%
2.86	10010	1.4	16.41%	-0.93%
3.63	10735	1.3	-3.85%	-0.46%
4.54	2049	3.5	-15.52%	1.25%
5.38	12403	1.4	-17.66%	-0.06%
5.97	9990	1.4	-18.57%	0.45%
6.63	11207	1.6	-21.84%	0.05%
7.31	10684	1.8	-24.80%	0.23%

Integrion Can Be Used for All Common Routine Applications



Integrion Application Proofs Available At Launch



- Anions in Drinking Water - 4 μm IonPac AS18 Column (Update AN154)
- Anions in Drinking Water (AB120)
- Anions in Drinking Water (AN154)
- Bromate in Drinking Water (AN167)
- Perchlorate in Drinking Water (AU148)
- Cations in Wastewater (AN141)



- Carbohydrates in Biofuels (new)
- Ammonia in NaHCO_3 (AN1073)
- Anions in Ethanol (AU194)
- Lithium assay of LiCO_3 (AN1090)



- Sugars in Juices (new)
- Sugars in Soft Drinks (new)
- Carbohydrates in Rum (new)
- Carbohydrates in Rice Wine (new)
- Carbohydrates in Liquors (new)
- Sugars in Functional Drinks (new)
- Glucosamine in Supplements (AN197)
- Carbohydrates in Wine (new)
- Carbohydrates in Whiskey (new)



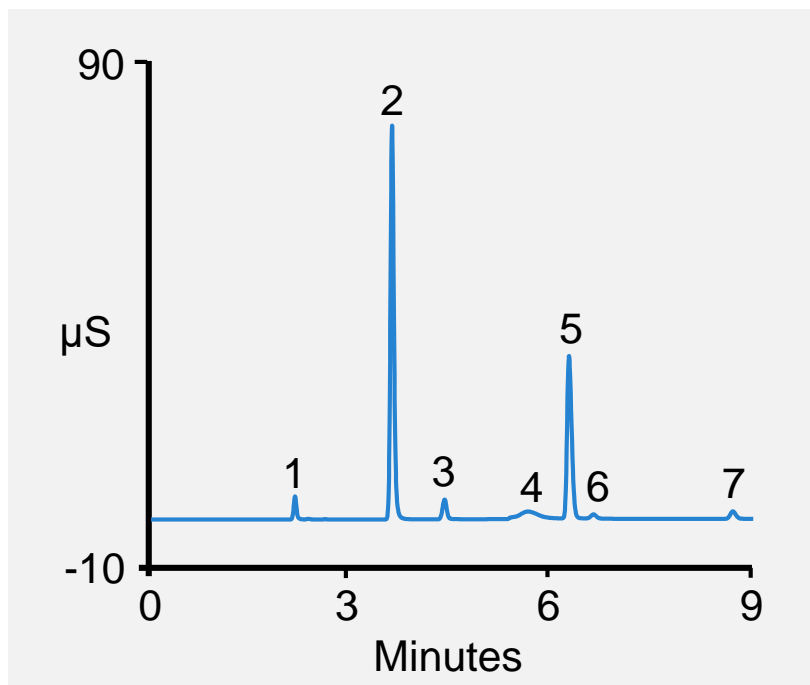
- Citrate in Drug Products (AN164)
- Heparin Sugar Impurity (AN233)
- Anions in Topiramate (AN258)



AN154 and Update with Dionex IonPac AS18-4 μ m column

Determination of Inorganic Anions in Environmental Waters
Using a Hydroxide-Selective Column

Municipal Wastewater Sample



Conditions

Columns: Dionex IonPac AG18-Fast-4 μ m
Dionex IonPac AS18-Fast-4 μ m,
4 \times 150 mm

KOH Gradient: 15–44 mM (0.2 to 6 min)

Eluent Source: Dionex EGC 500 cartridge with Dionex
CR-ATC 600 trap and Dionex high
pressure degasser devices

Flow Rate: 1 mL/min

Inj. Volume: 10 μ L

Column Temp.: 30 $^{\circ}$ C

Detection: Suppressed conductivity, Dionex
AERS 500, 4 mm, 109 mA, recycle

Sample Prep.: 5x dilution with deionized water

Peaks:

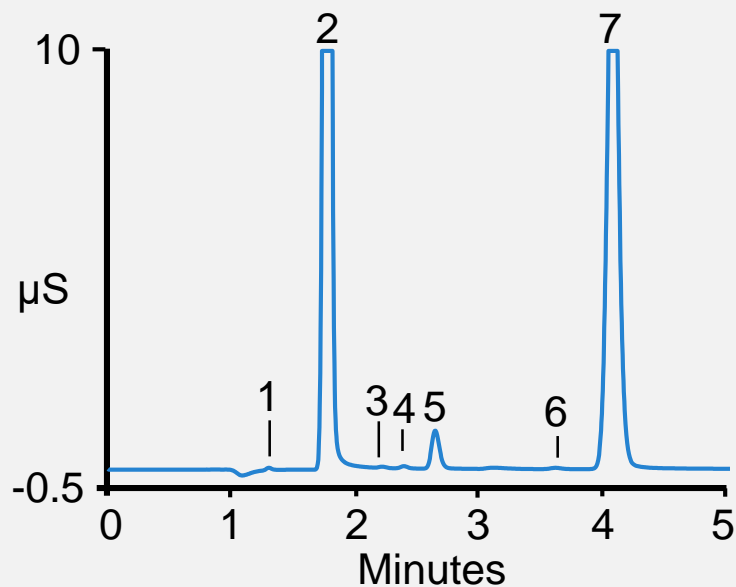
1. Fluoride	1.0	5. Sulfate	51.8	mg/L
2. Chloride	90.6	6. Nitrate	2.6	
3. Nitrite	1.0	7. Phosphate	0.36	
4. Carbonate	--			



AB120

Municipal Drinking Water Analysis by Fast IC

Municipal Drinking Water



Conditions

Columns: Dionex IonPac AG22-Fast-4 μ m
 Dionex IonPac AS22-Fast-4 μ m,
 2 \times 150 mm
Eluent: 4.5 mM Sodium Carbonate
 1.4 mM Sodium Bicarbonate
Flow Rate: 0.5 mL/min
Inj. Volume: 2.5 μ L
Column Temp.: 30 $^{\circ}$ C
Detection: Suppressed conductivity,
 Dionex AERS 500 Carbonate, 2 mm
 17 mA, recycle mode

Peaks:

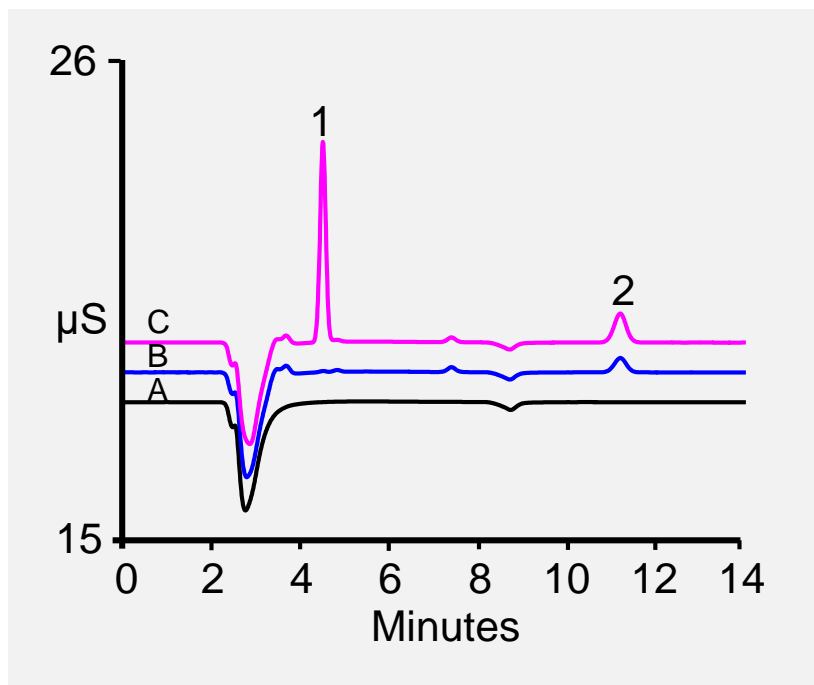
1. Fluoride	< 1	5. Nitrate	1.0	mg/L
2. Chloride	120	6. Phosphate	< 2	
3. Nitrite	< 1	7. Sulfate	56	
4. Bromide	< 1			



AU194

Determination of Existent and Potential Sulfate and Total Inorganic Chloride in Denatured Ethanol by Direct Injection

Denatured Ethanol Sample



Conditions

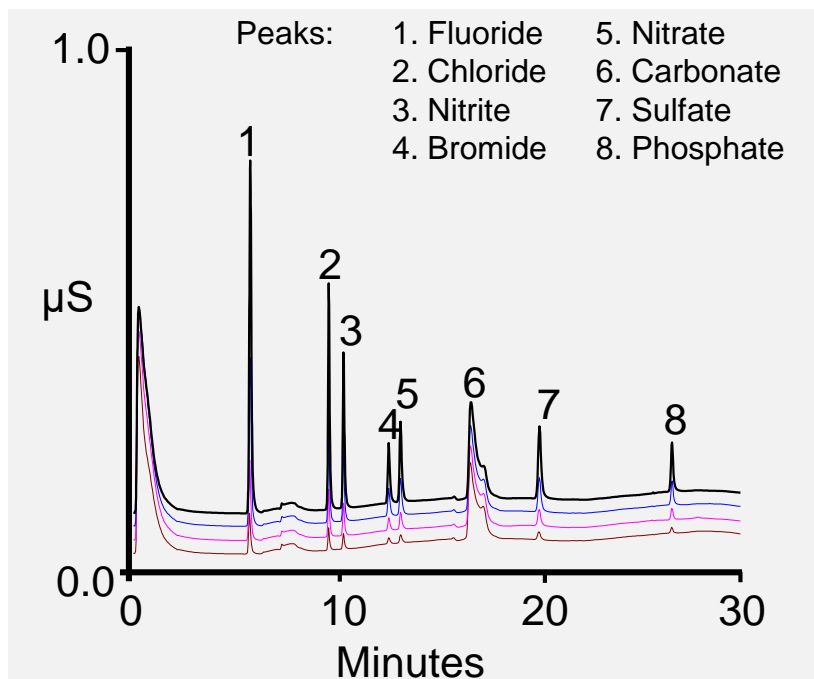
Columns:	Dionex IonPac AG22-Fast-4µm Dionex IonPac AS22-Fast-4µm, 4 × 150 mm												
Eluent:	4.5 mM Sodium Carbonate 1.4 mM Sodium Bicarbonate												
Flow Rate:	1.2 mL/min												
Inj. Volume:	25 µL												
Column Temp.:	30 °C												
Detection:	Suppressed conductivity, Dionex AERS 500 Carbonate, 4 mm, 40 mA, recycle mode												
Samples:	A: Denatured Reagent Ethanol B: Denatured Ethanol Sample C: Sample B plus 5 mg/L chloride and 1 mg/L sulfate												
Peaks:	<table border="0"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>1. Chloride</td> <td>--</td> <td>--</td> <td>6.6 mg/L</td> </tr> <tr> <td>2. Sulfate</td> <td>--</td> <td>0.9</td> <td>1.8</td> </tr> </tbody> </table>		A	B	C	1. Chloride	--	--	6.6 mg/L	2. Sulfate	--	0.9	1.8
	A	B	C										
1. Chloride	--	--	6.6 mg/L										
2. Sulfate	--	0.9	1.8										



Trace Analysis

Determination of ppt concentrations of trace anions using AutoPrep and EWP on an RFIC System

50, 100, 200, 400 ng/L Standard



Conditions

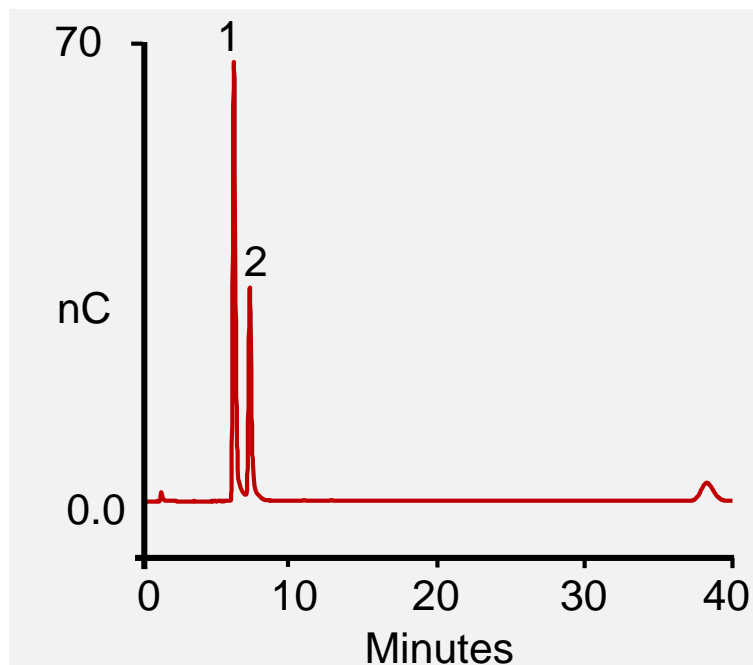
Columns: Dionex IonPac AS17-C set, 4 mm i.d.
 KOH Gradient: 50 mM wash (4.5 min); 1 mM (-7 to 4 min), 1–12.5 mM (4–10 min); 12.5–20 mM (10–20 min); 20–35 mM (20–30 min)
 Eluent Source: Dionex EGC 500 cartridge, CR-ATC 600 trap, high pressure degasser
 Flow Rate: 1 mL/min
 Column Temp.: 30 °C
 Detection: Suppressed conductivity, Dionex AERS 500e, 4 mm, 87 mA external water mode
 Sample Prep.: Dionex CRD 300 inline degassing, Dionex AutoPrep, EWP, 30 mA
 Concentrator: Dionex UTAC-LP2, 4 mm
 Sample Vol.: Sample (10 mL), Standard (10–80 µL)



Monosaccharides and Disaccharides

Monosaccharides and Disaccharides in a white balsamic vinegar sample using a High Carbohydrate kit

White Balsamic Vinegar Sample



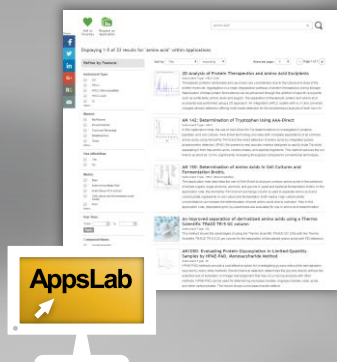
Conditions

Column: Dionex CarboPac PA20 guard,
Dionex CarboPac PA20, 3 mm i.d.
Eluent: 35 mM KOH, 100 mM KOH wash
from 15 to 25 min
Eluent Source: Dionex EGC 500 KOH cartridge,
Dionex CR-ATC 600 trap column,
high pressure degasser
Flow Rate: 0.50 mL/min
Inj. Volume: 0.4 μ L
Column Temp.: 30 $^{\circ}$ C
Detection: PAD, Au on PTFE, 62 mil gasket
Waveform: 4-Potential Carbohydrate
Ref. Electrode: Ag/AgCl
Sample Prep.: 100x dilution with deionized water

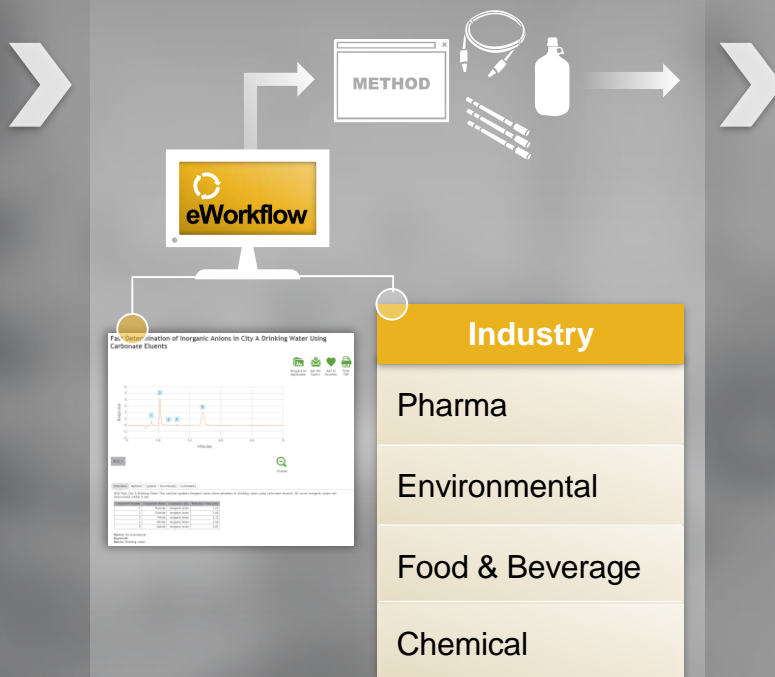
Peaks:	1. Glucose	1.18	g/L
	2. Fructose	0.73	

Welcome to the AppsLab Library of Analytical Applications

Searching



Find One-Click Workflows



Run



Troubleshooting Knowledgebase



Knowledge base is designed to help a user determine what went wrong with a run and how to rectify the issue

[Step-by-Step Directions](#)

[Automatic Control Toggling](#)

[Video Guides](#)

Troubleshooting Knowledgebase

Launch eWorkflow Smart Startup/Shutdown Release Control Monitor Baseline Consumables <Last Used>

Home Sampler Pump_ECD EDet CDet Electrolytics Audit Startup Queue

Pump_ECD Device Troubleshooting

Troubleshooting Main

Integrion IC Knowledgebase

Use this tool to troubleshoot any issues seen on chromatograms. Click on the provided links to reveal various symptoms, possible causes, and likely solutions to common ion chromatography issues.

The possible causes are listed in order from most common to least common. Once the appropriate solution has been identified, follow each step and utilize the controls provided at the bottom of the page when required. This eliminates the need to switch to the main ePanels, then back to this guide.

Most chromatogram-related issues fall into three categories:

1. [Peak Results](#)
2. [Baseline](#)
3. [Column Pressure](#)

Easily accessed in the Console

Main page presents user with three chromatographic symptom categories (links)

Troubleshooting Knowledgebase

Launch eWorkflow | Smart Startup/Shutdown | Release Control | Monitor Baseline | Consumables | <Last Used>

Home | Sampler | Pump_ECD | EDet | CDet | Electrolytics | Audit | Startup | Queue

Pump_ECD Device Troubleshooting

Troubleshooting Main | **Peak Results**

Peak Results

Peak results can be adversely affected by sample, eluent, column or system problems. These can cause changes in peak shape, differences between runs and the appearance of unaccounted for peaks:

Shape

Peaks appear to be misshapen. This can include peak fronting, tailing, broadening, non-Gaussian shapes, split peaks, etc.

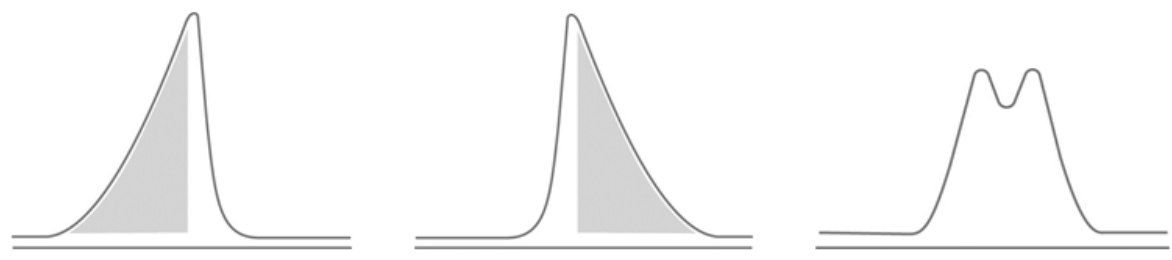


Figure 1: Peak Fronting Figure 2: Peak Tailing Figure 3: Peak Splitting

Reproducibility

Changes in retention time or peak area across injections.

List of possible symptoms and representative images for selected category

Consumables Installation Guides

Simple Installation

Guides are designed to make installation of IC consumables much easier

Automatic Control Toggling

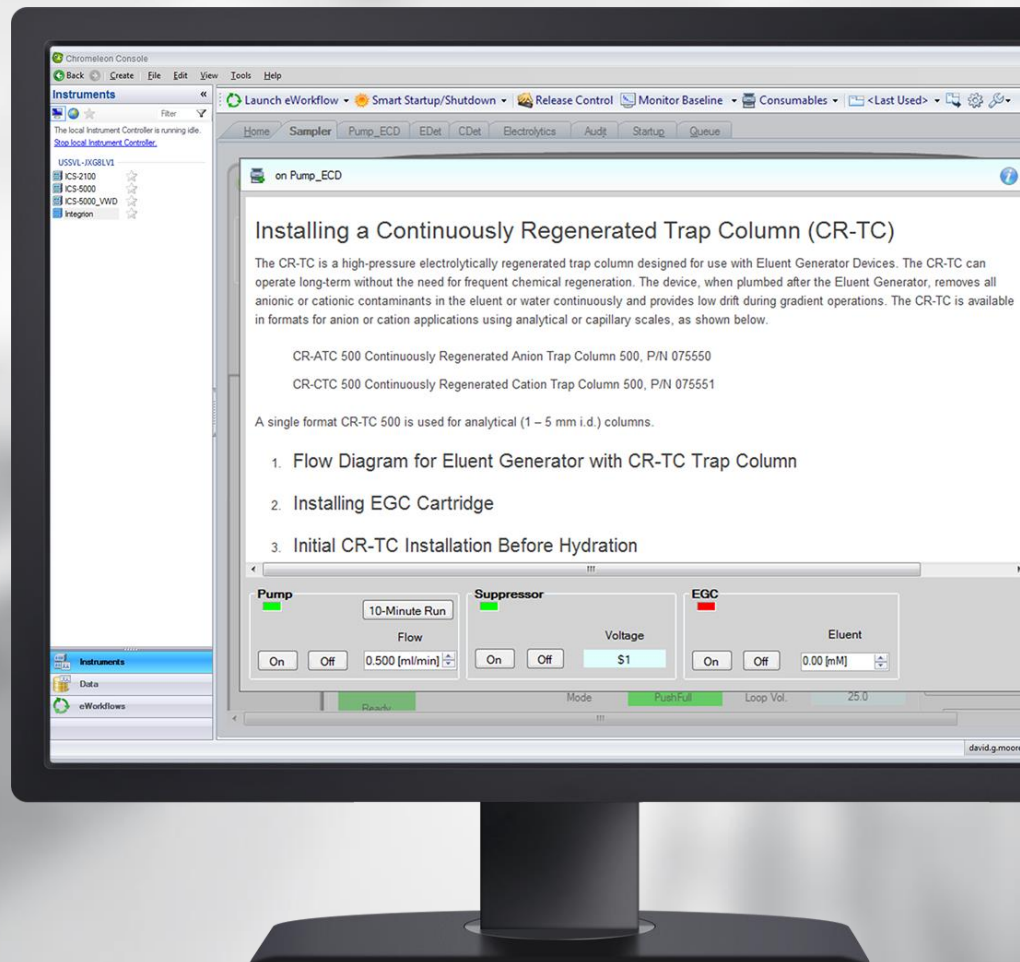
All controls required for each installation are automatically displayed

Step-by-Step Directions

Detailed, step-by-step instructions for each type of consumable

Video Guides

Each guide also includes a video that shows exactly how a given consumable is installed



Consumables Installation Guides

The screenshot displays the ThermoFisher console interface. At the top, the 'Consumables' menu is open, showing a tree structure with 'Inventory' expanded to 'Pump_ECD'. Under 'Pump_ECD', the following options are listed: CRD Installation, EGC Installation, Column Installation, CR-TC Installation (highlighted with a blue selection bar), and CRS Installation. The main interface is divided into several sections: 'ED' (0.000 nC, 400.000 μS), 'EGC' (On/Off, Concentration 0.00 [mM]), 'CR-TC' (On/Off), 'Suppressor' (On/Off), 'Pump' (Flow 0.500 [ml/min], Pressure 0 [psi], Upper Limit 3000.00 [psi], Lower Limit 200.00 [psi]), and 'Valves' (HP Valve A, LP Valve 1 Closed, LP Valve 2 Closed). A chromatogram plot is visible on the right, and a log table at the bottom shows system messages.

Date	Time	Retention Time	Device	Message
11/12/2015	12:07:33 PM -08:00			User Jay Lorch (jlor...
11/12/2015	12:07:17 PM -08:00		Pump_E...	Connectio n establis...
11/12/2015	12:07:17 PM -08:00		Pump_E	Log

Easily accessed in the Console

Consumables Installation Guides

Launch eWorkflow | Smart Startup/Shutdown | Release Control | Monitor Baseline | Consumables | <Last Used>

Home | **Sampler** | Pump_ECD | EDet | CDet | Electrolytics | Audit | Startup | Queue

on Pump_ECD

Installing a Continuously Regenerated Trap Column (CR-TC)

The CR-TC is a high-pressure electrolytically regenerated trap column designed for use with Eluent Generator Devices. The CR-TC can operate long-term without the need for frequent chemical regeneration. The device, when plumbed after the Eluent Generator, removes all anionic or cationic contaminants in the eluent or water continuously and provides low drift during gradient operations. The CR-TC is available in formats for anion or cation applications using analytical or capillary scales, as shown below.

CR-ATC 500 Continuously Regenerated Anion Trap Column 500, P/N 075550
CR-CTC 500 Continuously Regenerated Cation Trap Column 500, P/N 075551

A single format CR-TC 500 is used for analytical (1 – 5 mm i.d.) columns.

- Flow Diagram for Eluent Generator with CR-TC Trap Column
- Installing EGC Cartridge
- Initial CR-TC Installation Before Hydration

Pump 10-Minute Run
Flow: On Off 0.500 [ml/min]

Suppressor
Voltage: On Off \$1

EGC
Eluent: On Off 0.00 [mM]

Ready Mode: PushFull Loop Vol.: 25.0

Brief description of selected consumable

Step-by-step guide to install consumable

Each major step expands to reveal any subordinate steps and any major step can be expanded/collapsed

Any controls required for the installation are displayed at the bottom of the page

Consumables Installation Guides

Launch eWorkflow Smart Startup/Shutdown Release Control Monitor Baseline Consumables <Last Used>

Home Sampler Pump_ECD EDet CDet Electrolytics Audit Startup Queue

on Pump_ECD

5. Complete CR-TC Trap Column Plumbing for Operation

CR-TC_Installation_20150715

01:56

Pump 10-Minute Run
Flow: 0.500 [ml/min]
On Off

Suppressor
Voltage: \$1
On Off

EGC
Eluent: 0.00 [mM]
On Off

Ready Mode: PushFull Loop Vol.: 25.0

Video guidance is also provided for each consumable

Consumables Inventory – New Tools

The screenshot displays the 'Consumables' dropdown menu in the software interface. The menu is open, showing a list of items under the 'Inventory' section, with 'Pump_ECD' expanded to show its sub-items: CRD Installation, EGC Installation, Column Installation, CR-TC Installation, and CRS Installation. The background interface includes a top navigation bar with 'Launch eWorkflow', 'Smart Startup/Shutdown', 'Release Control', and 'Monitor Baseline'. Below this are tabs for 'Home', 'Sampler', 'Pump_ECD', 'EDet', 'CDet', 'Electrolytics', 'Audit', 'Startup', and 'Queue'. The main control area features sections for 'ED' (with values \$1 and μS), 'EGC' (On/Off, Concentration 0.00 [mM]), 'CR-TC' (On/Off), 'Suppressor' (On/Off), 'Pump' (Flow 0.500 [ml/min], Pressure 0 [psi], Upper/Lower Limits, Prime, Settings), and 'Valves' (Inj Valve, HP Valve, LP Valve 1, LP Valve 2). A chromatogram plot is visible on the right, and a log table at the bottom shows system messages.

	Date	Time	Retention Time	Device	Message
i	11/12/2015	12:07:33 PM -08:00			User Jay Lorch (jlor...
i	11/12/2015	12:07:17 PM -08:00		Pump_E...	Connection establis...
	11/12/2015	12:07:17 PM -08:00		Pump_E	Log

Also easily accessed in the Console under the same dropdown

Consumables Inventory – New Tools

The screenshot shows the 'Consumables Inventory' window. At the top, there are navigation tabs: Home, Sampler, Pump_ECD, EDet, CDet, Electrolytics, Audit, Startup, and Queue. Below these is a toolbar with icons for Launch eWorkflow, Smart Startup/Shutdown, Release Control, Monitor Baseline, Consumables, and Last Used. The main area is titled 'Consumables Inventory' and contains a table of 'Installed Consumables'.

	Tracked	Part No.	Description	Size	Chemistry	Serial No.	Lot No.	Detected By
12	<input checked="" type="checkbox"/>	082541	Dionex AERS 500 (2 mm)	Microbore	Anion	140101000	01501002H	cable
13	<input type="checkbox"/>	085091	Dionex ACRS (2 mm)	Microbore	Anion	140101004	00000000D	RFID
14	<input checked="" type="checkbox"/>	088662	Dionex CR-ATC 600	Analytical	Anion	140101000	00000000A	cable
15	<input checked="" type="checkbox"/>	088670	Unknown	Microbore	Cation	140101000	01501002	cable

Below the table, there is a section for 'Details for Dionex ACRS (2 mm) (Serial No. 140101004):'. It includes a table with columns: Name, Week, Index, and Value.

	Name	Week	Index	Value
60	BackgroundConductivity	22		3.3
61	BackgroundConductivity	23		3.4
62	BackgroundConductivity	24		3.5
63	BackgroundConductivity	25		3.6
64	BackgroundConductivity	26		3.7
65	TotalInjections			9999

At the bottom, there is a 'Compatibility Check Results' section with two warning icons and messages:

- One or more devices does not have an approved consumables set.
- Instrument is tracking consumables of unknown or incompatible size.
- Instrument is tracking consumables of unknown or incompatible chemistry.

Below the warnings, there is a text box with instructions: 'If the list is missing any installed consumables, check all connections, ensure that each RFID tag is correctly oriented, and click Rescan. At least one configured device requires that consumables be approved before injections can be run.' To the right of this text are three buttons: Rescan, Approve, and Close.

User can select/unselect consumables to be tracked

Lists RFID-detected and cable-connected consumables, as well as the details for each

Simplified Consumables Installation – New Tools

The screenshot shows the 'Consumables Inventory' window in a software application. The window title bar includes navigation options like 'Home', 'Sampler', 'Pump_ECD', 'EDet', 'CDet', 'Electrolytics', 'Audit', 'Startup', and 'Queue'. The main content area is divided into two sections:

Installed Consumables:

	Tracked	Part No.	Description	Size	Chemistry	Serial No.	Lot No.	Detected By
12	<input checked="" type="checkbox"/>	082541	Dionex AERS 500 (2 mm)	Microbore	Anion	140101000	01501002H	cable
13	<input checked="" type="checkbox"/>	085091	Dionex ACRS (2 mm)	Microbore	Anion	140101004	00000000D	RFID
14	<input checked="" type="checkbox"/>	088662	Dionex CR-ATC 600	Analytical	Anion	140101000	00000000A	cable
15	<input checked="" type="checkbox"/>	088670	Unknown	Microbore	Cation	140101000	01501002	cable

Details for Dionex ACRS (2 mm) (Serial No. 140101004):

Drag a column header here to group by that column.

	Name	Week	Index	Value
60	BackgroundConductivity	22		3.3
61	BackgroundConductivity	23		3.4
62	BackgroundConductivity	24		3.5
63	BackgroundConductivity	25		3.6
64	BackgroundConductivity	26		3.7
65	TotalInjections			9999

Compatibility Check Results:

- One or more devices does not have an approved consumables set.
- Instrument is tracking consumables of unknown or incompatible size.
- Instrument is tracking consumables of unknown or incompatible chemistry.

If the list is missing any installed consumables, check all connections, ensure that each RFID tag is correctly oriented, and click Rescan.
At least one configured device requires that consumables be approved before injections can be run.

Buttons: Rescan, Approve, Close

Lists all data associated with the selected consumable

Simplified Consumables Installation – New Tools

The screenshot displays the 'Consumables Inventory' window in a software application. The window title bar includes navigation options like 'Home', 'Sampler', 'Pump_ECD', 'EDet', 'CDet', 'Electrolytics', 'Audit', 'Startup', and 'Queue'. The main content area is titled 'Consumables Inventory' and contains a table of installed consumables. The table has columns for 'Tracked', 'Part No.', 'Description', 'Size', 'Chemistry', 'Serial No.', 'Lot No.', and 'Detected By'. Row 13 is highlighted in blue, showing a Dionex ACRS (2 mm) with Serial No. 140101004 and Lot No. 00000000D, detected by RFID. Below the table, there is a section for 'Details for Dionex ACRS (2 mm) (Serial No. 140101004):' which includes a table of background conductivity readings over several weeks and a 'TotalInjections' count of 9999. At the bottom, a 'Compatibility Check Results' section shows three warning icons and messages: 'One or more devices does not have an approved consumables set.', 'Instrument is tracking consumables of unknown or incompatible size.', and 'Instrument is tracking consumables of unknown or incompatible chemistry.'. There are also buttons for 'Rescan', 'Approve', and 'Close'.

Tracked	Part No.	Description	Size	Chemistry	Serial No.	Lot No.	Detected By
<input checked="" type="checkbox"/>	082541	Dionex AERS 500 (2 mm)	Microbore	Anion	140101000	01501002H	cable
<input checked="" type="checkbox"/>	085091	Dionex ACRS (2 mm)	Microbore	Anion	140101004	00000000D	RFID
<input checked="" type="checkbox"/>	088662	Dionex CR-ATC 600	Analytical	Anion	140101000	00000000A	cable
<input checked="" type="checkbox"/>	088670	Unknown	Microbore	Cation	140101000	01501002	cable

Name	Week	Index	Value
BackgroundConductivity	22		3.3
BackgroundConductivity	23		3.4
BackgroundConductivity	24		3.5
BackgroundConductivity	25		3.6
BackgroundConductivity	26		3.7
TotalInjections			9999

Compatibility Check Results:

- One or more devices does not have an approved consumables set.
- Instrument is tracking consumables of unknown or incompatible size.
- Instrument is tracking consumables of unknown or incompatible chemistry.

Buttons: Rescan, Approve, Close

Automatically checks consumable compatibility and indicates any possible mismatches or other problems



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