ThermoFisher SCIENTIFIC

Transform complexity into CLARITY



Thermo Scientific Dionex ICS-6000 HPIC System

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Simplify challenging IC workflows with high-pressure performance



The Thermo Scientific™ Dionex™ ICS-6000 High-Pressure Ion Chromatography (HPIC™) system is a modular, highly configurable, high-performance system. Its robust system design enables operation at up to 5,000 psi and produces consistent, reliable results. As a top-of-the line ion chromatography (IC) system, it offers labs the confidence, flexibility, and performance to run their most complex IC workflows reliably, all while reducing cost and waste, and simplifying the path from development to routine operation.

Confidence through reliability

The Dionex ICS-6000 HPIC system offers a suite of features to provide reliable, reproducible analysis for confident results, including:

- Automated eluent preparation using Reagent-Free Ion Chromatography-Eluent Generation (RFIC-EG™) technology
- Finger-tight connections that help minimize dead volume and make connections easier
- Smart start-up and stand-by operations with a powerful, easy-to-use chromatography data system

Efficient performance

The Dionex ICS-6000 HPIC system is designed to accelerate your path from sample to results while helping your laboratory operate more efficiently through features such as:

- Flexible system configurations with single- or dual-channel options and a variety of detectors to meet a wide range of application needs
- Microbore operation that reduces sample and eluent consumption as well as waste generation
- High-pressure operation with 4 µm particle-size IC columns that improve chromatographic efficiency, enabling shorter run times and enhanced separation resolution



Advanced workflows made simple

As a modular, highly configurable instrument, the Dionex ICS-6000 HPIC system can address a full range of IC applications, such as:

- High-performance anion-exchange chromatography with pulsed amperometric detection (HPAE-PAD) for complex carbohydrate analysis
- Ion chromatography-mass spectrometry (IC-MS) analyses
- Two-dimensional ion chromatography (2D-IC) for trace-level analysis in samples containing high concentrations of interfering matrix ions
- Workflows requiring automated sample preparation steps such as preconcentration, matrix elimination, and postcolumn reagent addition



Confidence through reliability

Automated eluent generation

The RFIC-EG module of the Dionex ICS-6000 HPIC system uses Thermo Scientific™ Dionex™ EGC Eluent Generator Cartridges to electrolytically generate high-purity hydroxide, carbonate, bicarbonate, or methanesulfonic acid (MSA) eluents at the concentration you specify. A high purity source of deionized water is the only requirement. RFIC-EG provides control for isocratic or gradient conditions with unmatched method reproducibility and accuracy. Improved control of the eluent generator (EG) cartridge also minimizes system start-up times, increasing productivity.

Easy-to-install, finger-tight fittings

Achieving consistent low-dead-volume connections is critical for maintaining optimum chromatographic efficiency. Conventional fittings can increase column broadening due to incorrect positioning of the ferrule, leading to reduced efficiencies and poor peak shapes. Thermo Scientific™ Dionex™ IC PEEK Viper™ fittings provide consistent, finger-tight connections with virtually zero dead volume and require minimal training time.



Reliable data analysis for predictable performance

Experience the full capabilities of the Dionex ICS-6000 HPIC system by using Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS). Our CDS not only delivers an exceptional user experience, it also boosts productivity. Chromeleon CDS features:

- Increased reliability—utilize Smart Startup, Standby, and Shutdown features to enable unattended system startup, automatic initialization and equilibration, and safe shutdown
- Simplified administration—centralized administration of licenses, users, and network resources
- Thermo Scientific™ AppsLab™ Library of Analytical Applications—an online repository of searchable chromatography methods for multiple industries
- Increased lab efficiency—perform both IC and IC-MS analyses with Chromeleon CDS

Efficient performance

Unmatched application range

Configure your Dionex ICS-6000 HPIC system as a hybrid system or dual system. Either configuration includes a wide variety of available column chemistries. Choose microbore (1–3 mm) or standard bore (3–7 mm), or combine formats, based on your sample, analytes, and mobile phase requirements.

Benefits of microbore operation

When configured as a microbore system, the Dionex ICS-6000 HPIC system can reduce eluent usage, sample usage, and waste by up to 4x, resulting in a lower overall cost-per-sample.



Versatile detection capabilities

The Dionex ICS-6000 HPIC system supports a variety of detectors, including:

- Suppressed conductivity
- Electrochemical, including DC amperometry and integrated amperometry
- UV-Vis absorbance, including variable wavelength and photodiode array
- Inductively coupled plasma mass spectrometry (ICP-MS)
- Mass spectrometry (MS)

High-pressure IC

The Dionex ICS-6000 HPIC system can operate at up to 5,000 psi to allow the use of 4 µm-particle-size IC columns, available in 150 or 250 mm lengths. The 150 mm columns decrease run times, while maintaining chromatographic resolution when compared to 10 µm particle-size columns. The 250 mm columns offer improved peak resolution.

Complex carbohydrate analysis

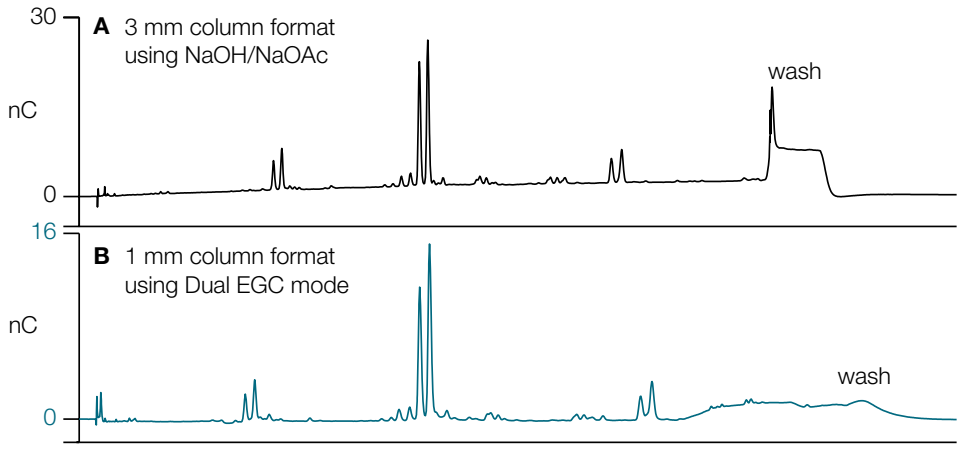
The Dionex ICS-6000 HPIC system can be used to perform HPAE-PAD for the determination of carbohydrates without the need for derivatization or a chromophore.

In addition, the system includes an operating mode called Dual Eluent Generation Cartridge (Dual EGC), designed to simplify complex carbohydrate analysis. With Dual EGC, you can electrolytically generate potassium hydroxide/potassium methanesulfonate (KOH/KMSA) eluents.

The 1 mm format Thermo Scientific™ Dionex™ CarboPac™ Columns for Dual EGC mode provide predictable, high-resolution separations of monosaccharides, disaccharides, sialic acids, and complex oligosaccharides.



Download the brochure to learn more about Dual EGC mode.



Feutin alditol oligosaccharide analysis using (A) manually prepared eluents (NaOH/NaOAc) and (B) Dual EGC mode (KOH/KMSA) with 1 mm column format.

Advanced workflows made simple

Discover IC-MS

The Dionex ICS-6000 HPIC system is compatible with single quadrupole, triple quadrupole, and high-resolution accurate-mass (HRAM) Thermo Scientific™ Orbitrap™ mass analyzer-based mass spectrometers for performing powerful IC-MS analyses.

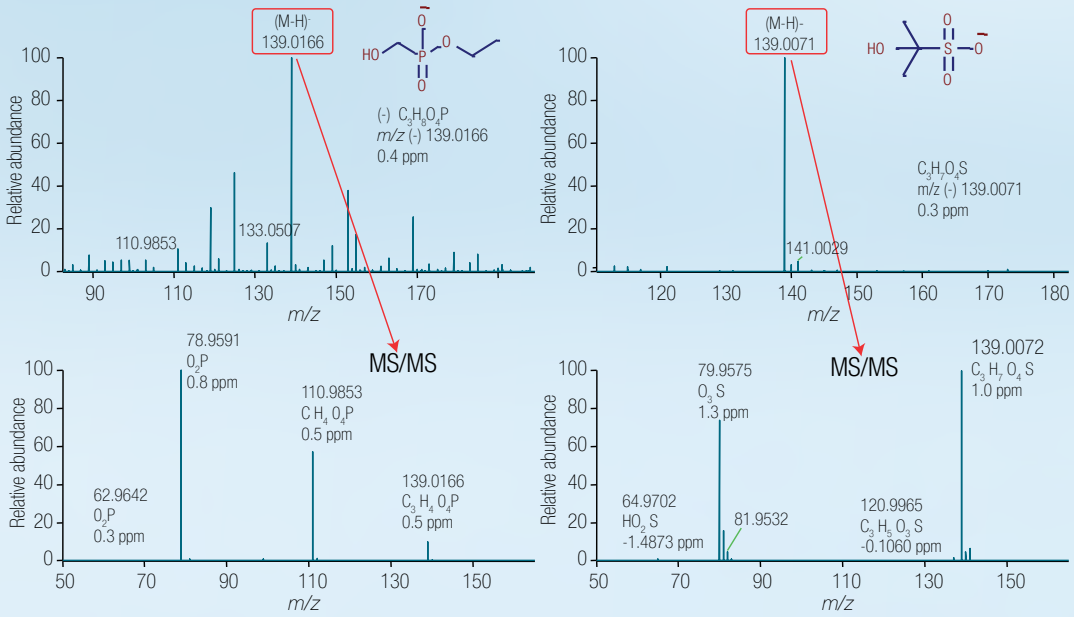
Detection using MS enhances your chromatographic analyses with improved selectivity and higher sensitivity. IC with suppressed conductivity is ideally suited for IC-MS applications because the suppressor converts the mobile phase into water using Reagent-Free™ Ion Chromatography (RFIC) technology.

The Dionex ICS-6000 HPIC system can be used for a wide variety of sample analyses due to its quaternary gradient capability and low-temperature thermal control. Additionally, all data analysis and reporting can be performed using Chromeleon CDS.

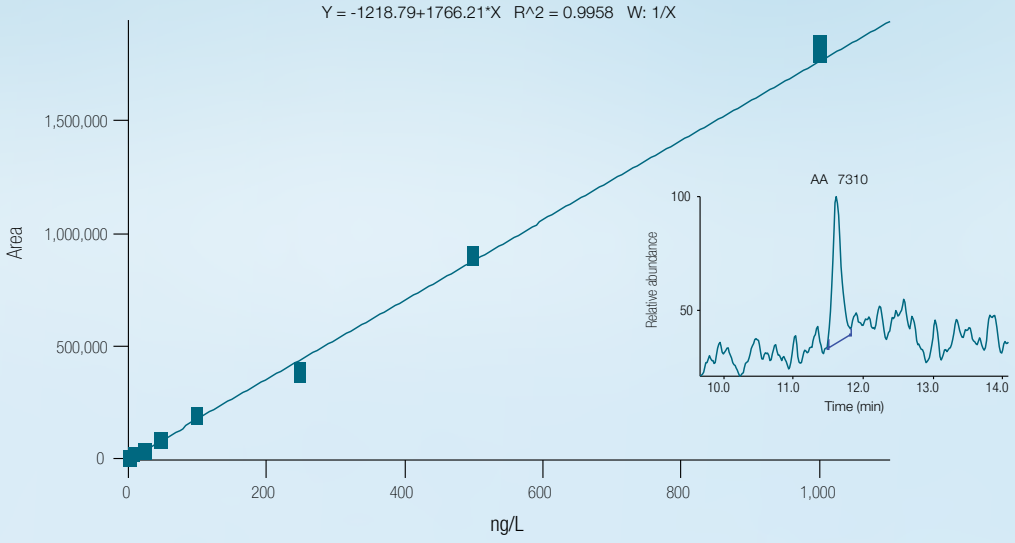
Adding MS to your workflow:

- Enables direct injection with no derivatization
- Eliminates sample preparation, saving time
- Precludes use of organic modifiers in separations
- Provides confirmatory, orthogonal information





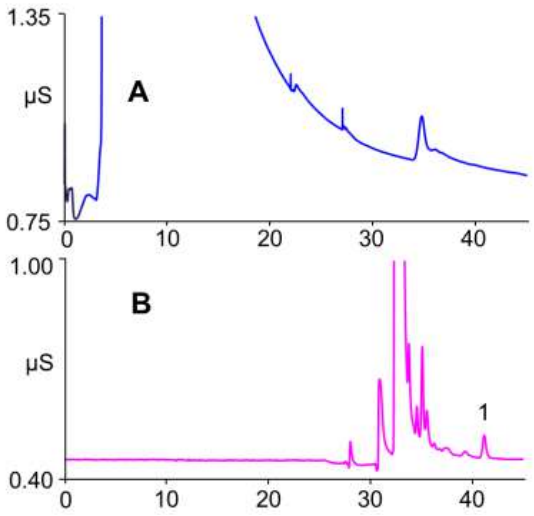
HRAM MS/MS fragments facilitate identification of unknown compounds. IC, combined with HRAM MS, is an ideal solution for component identification in non-targeted and unknown workflows. In this figure, identification of lithium-ion battery failure analysis products using HRAM MS/MS offers four-decimal-point accuracy to distinguish between species. The unique fragmentation signature enhances that confidence.



Targeted MS/MS analysis enables quantitation of molecules in a wide variety of matrices. IC, combined with triple quadrupole MS, is an ideal solution for resolving molecules that are often difficult to separate from a matrix using conventional liquid chromatography techniques. In this chromatogram, glyphosate in drinking water is detected at a level of 5 ng/L. The linearity of the assay allows quantitation over 3 orders of magnitude, from 5 ng/L to 1,000 ng/L, enabling a wide detection range without having to dilute samples.

Trace analysis using two-dimensional IC

The Dionex ICS-6000 HPIC system is ideal for 2D-IC analyses. This technique is particularly important when performing trace analysis in the presence of a high concentration of interfering matrix ions. It achieves improved selectivity and signal enhancement without complicated sample preparation.



A. First-dimension conditions

Column:	Thermo Scientific™ Dionex™ IonPac™ AG20, AS20, 4 mm
Flow rate:	1.0 mL/min
Concentration:	35 mM KOH
Suppressor:	Electrolytic suppression
Current:	150 mA

B. Second-dimension conditions

Column:	Thermo Scientific™ Dionex™ IonPac™ AG16, AS16, 2 mm
Flow rate:	0.25 mL/min
Concentration:	65 mM KOH
Suppressor:	Electrolytic suppression
Current:	41 mA
Loop:	4,000 µL
Concentrator:	Thermo Scientific™ Dionex™ IonPac™ TAC-ULP1 (5 x 35 mm)
Oven:	30 °C
Peak:	Perchlorate 0.5 mg/L
Matrix:	
Chloride:	1,000 mg/L
Bicarbonate:	1,000
Sulfate:	1,000

Automated sample preparation capabilities

The Dionex ICS-6000 HPIC system offers the most comprehensive set of automated sample preparation features, along with the ability to combine them into a single workflow. Select from a variety of techniques, such as:

Technique	Features
Filtration	In-line Thermo Scientific™ Dionex™ AS-DV Autosampler filters In-line filter frit cartridges
Dilution	AutoDilution with the Thermo Scientific™ Dionex™ AS-AP Autosampler and Chromeleon CDS
Matrix elimination	Thermo Scientific™ Dionex™ InGuard™ Cartridges Thermo Scientific™ Dionex™ IonPac™ NG1 Columns Thermo Scientific™ Dionex™ Continuously Regenerated Trap Columns AutoNeutralization
Pre-concentration	Electrolytic water purifiers (EWPs) AutoPrep Thermo Scientific™ Dionex™ Concentrator Columns
Specialty	Combustion IC, air sampling

We support researchers and scientists around the world in transforming complex analytical challenges into clear, reliable results

For more than 50 years, Thermo Fisher Scientific has been dedicated to advancing IC through continuous innovation in instruments, separation chemistries, suppressors, and software. The Dionex ICS-6000 HPIC system combines the confidence, flexibility, and high-performance capabilities laboratories need to simplify complex workflows, accelerate the path from development to routine operation, and achieve reliable, reproducible results.

When you invest in an IC instrument, you are investing in a partnership. As an industry leader, we are committed to supporting your laboratory with trusted expertise, innovative technologies, and responsive service to help you achieve your scientific goals with confidence.



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