



Thermo Scientific Dionex ICS-5000
Capillary Ion Chromatography System

Global Food and Beverage Testing Solutions

Thermo
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World's First Capillary Ion Chromatography System

The Dionex ICS-5000 Reagent-Free™ Ion Chromatography (RFIC™) System with eluent generation is the most powerful IC system on the market today. Developed for flexibility, modularity, and ease of use, this system combines the highest sensitivity with convenience. The Dionex ICS-5000 is available for capillary, microbore, and standard-bore flow rates (or a combination of any two using the dual system), providing flexibility to choose highest throughput or sensitivity. The wide variety

of Dionex ICS-5000 modules enables configuration of an IC system specifically designed to solve the needs of your lab, while making upgrades easy and economical to adapt to your lab's changing needs.



Why choose the Dionex ICS-5000 for your lab?

- **Less Calibration**

System performance is more consistent and can be verified quickly just by running a check standard.

- **Flexibility**

The Dionex ICS-5000 can be configured for routine, dedicated analysis in capillary, microbore, or standard-bore formats.

- **No Startup or Equilibration Time**

Sample turnaround time is reduced because the system is always on and ready for walk-up analysis on demand.

- **Improved Performance**

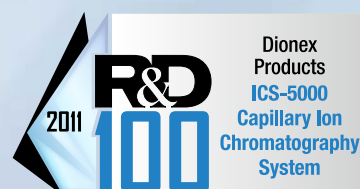
Ultrastable eluent concentrations provide reproducible results with little variability in peak retention times or areas. Mass sensitivity is improved 100-fold by scaling the diameter of the column down from 4 mm to 0.4 mm.

- **No Eluent Preparation**

The Dionex ICS-5000 Capillary IC system only requires 15 mL of water a day to electrolytically generate eluent for either isocratic or gradient separations.

- **Reduced Costs—Low Overall Cost of Ownership**

- Greener technology
- Less down time
- Increased productivity when lab staff is freed up to perform other important tasks.



How Does the Dionex ICS-5000 Benefit Food and Beverage Analysis?

Ion chromatography plays an important role in the analysis of food and beverage samples, especially when there is a need for greater sensitivity. Whether for food safety testing, quality control, or research and product development, IC plays an integral role in food laboratories.

Ion chromatography is used in the analysis of many analytes. The most routine IC analysis is of common anions and cations in water and beverages. Ion chromatography is also heavily used for the analysis of carbohydrates, organic acids, and many food safety-related contaminants, such as bromate, biogenic amines, melamine, sulfate/sulfite, and nitrate/nitrite.

The Dionex ICS-5000 is tailored for food and beverage applications. With the growing number of incidents regarding contaminants in foods, increased sensitivity, and robust applications in complex matrices, the Dionex ICS-5000 is optimally designed for modularity and flexibility. The added value of capillary IC makes the Dionex ICS-5000 the most powerful reagent-free, on-demand IC system on the market today. With options for single or dual configurations, and the ability to support standard bore or microbore—and now capillary—here is an opportunity to expand your lab's capabilities and improve your daily workflow.



Less Calibration

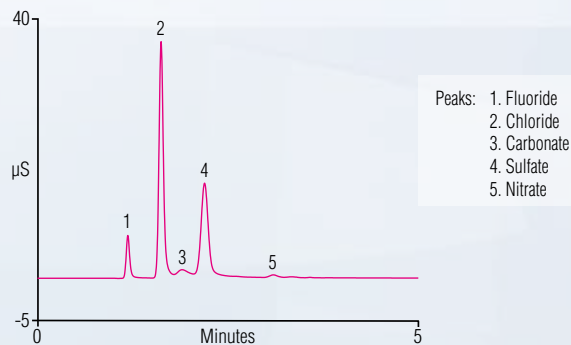
Drinking water plays an important role in the manufacturing of various beverages, from soft drinks to fruit juices. The quality of the drinking water used in the production of these drinks needs to be tested to ensure that the final beverage will have the desired taste and is contaminant free. By leaving the Dionex ICS-5000 always on and electrolytically generating the eluent, variations in the preparation of the mobile phase are not introduced and the background is less prone to changes, thereby reducing the need to calibrate. A check standard prior to running the sample is all that's required to verify system performance.



Flexibility

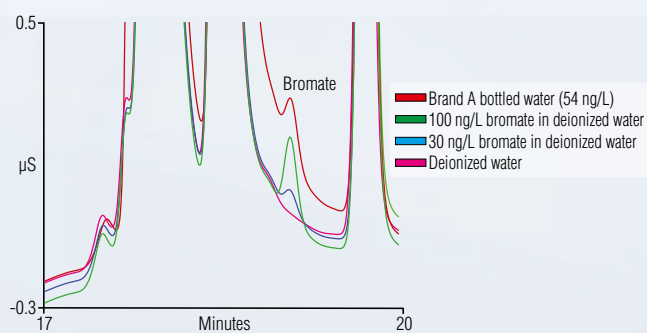
Bottled water is the preferred beverage around the world. Consumption of safe and reliable drinking water is essential to maintain health, and in some countries, bottled water is a necessity. To ensure its safety, bottled water needs to be disinfected to kill any microbes present. Although the preferred disinfectant method is ozonation—one of the most effective treatments available—one disadvantage is the contaminate byproduct bromate that can be formed in water containing naturally occurring bromide. The Dionex ICS-5000's versatility enables it to be configured for multiple applications, such as two-dimensional IC analysis of ultratrace amounts of bromate in high ionic matrices, with ease.

Fast Separation of Common Anions in Drinking Water Using a Capillary RFIC System



An overlay of 30 consecutive runs provides fast determination of five common anions in a drinking water sample with excellent reproducibility in terms of retention time and peak area responses in less than 5 min using the Thermo Scientific Dionex IonPac™ AS18-Fast Capillary Column.

Trace Bromate Analysis in Bottled Water Using a 2-D Capillary RFIC System with Second-Dimension Capillary Column



A 4 mm Dionex IonPac AS19 standard column was used in the first dimension and a 0.4 mm Dionex IonPac AS20 capillary column in the second. The cut time window of 7.5 to 9 minutes was used to transfer 2500 μL of the first-dimension effluent onto a Thermo Scientific Dionex IonSwift capillary concentrator column. Results indicate that the ICS-5000 was capable of determining bromate at parts-per-trillion levels in bottled water samples.

No Startup or Equilibration Time

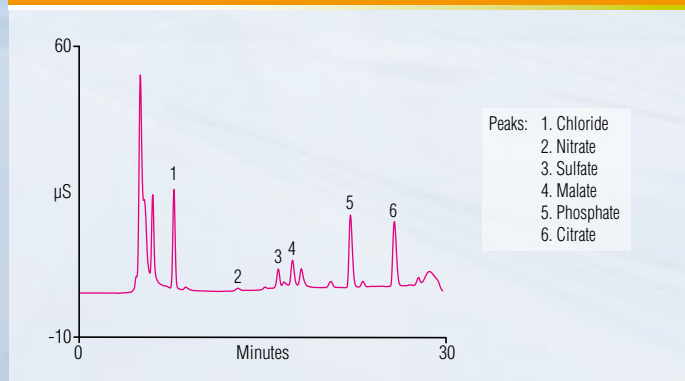
Soft drinks are complex mixtures containing a variety of ingredients. To maintain product consistency and quality, some manufacturers quantify the amount of acidulant (commonly phosphoric and citric acids) used for each production batch. Because the Dionex ICS-5000 can be left on and running for routine analysis, elimination of instrument start-up and equilibration translates into significant time-savings and quicker sample turnaround. The Dionex ICS-5000 is truly an IC on-demand system, so product variations are identified at an early stage and quickly corrected in production environments.

Improved Performance

Detecting carbohydrate type and concentration is important when determining the standards of identity in a quality control/assurance environment, to provide information for nutritional labeling, and for adulteration. Leaving the Dionex ICS-5000 always on—combined with the consistency of its RFI/eluent-generation system technology—yields ultrastable eluent concentrations and provides reproducible results with little variability in peak retention times or areas. The Dionex ICS-5000 provides greater application flexibility for eluting strongly retained sugars and also allows for routine column washes on line without the need to manually prepare strong hydroxide wash solutions.

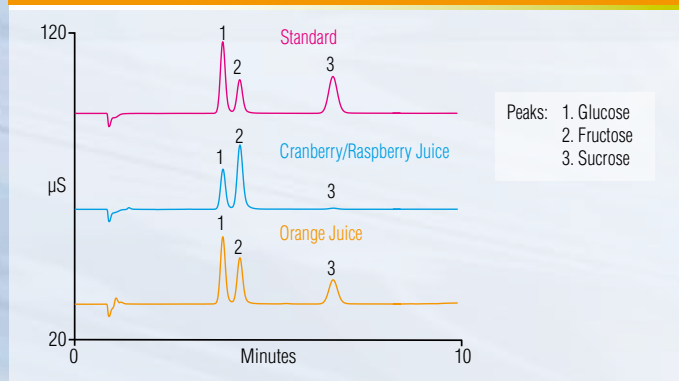


Anions in Cola



Ion chromatography simultaneously determines phosphoric and citric acid acidulants in soft drinks by measuring the corresponding anions, phosphate, and citrate.

Fruit Juice Profiles (Sugar Analysis)



In this comparison of fruit juices against the sugar standards, cranberry/raspberry juice is shown to have a different sugar profile than orange juice. Both separations were performed in less than 10 min using the Thermo Scientific Dionex CarboPac™ PA20 column with pulsed amperometric detection (PAD).

No Eluent Preparation

Evaluating monosaccharides using the Dionex ICS-5000 for high-performance anion-exchange chromatography (HPAE) coupled with PAD eliminates the need for eluent preparation. Carbohydrates such as glucosamine can be determined without chemical derivatization in less than 12 minutes. Nothing comes close to the ease of use, reproducibility, and performance of the Dionex ICS-5000's RFIC/eluent-generation system.

Low Overall Cost of Ownership

For wine production, detailed sugar analysis can be essential for new product development or quality control. The Dionex ICS-5000 requires no eluent preparation, startup time, or system equilibration. Because it uses only water as the eluent, the system requires less frequent preventive maintenance. Dramatically reduced waste (from 520 L to 5.2 L per year) reduces disposal costs. The easy-to-replace Eluent Generator Cartridge lasts for 18 months under continuous operation. Combination of all these factors lowers the overall cost of ownership, thereby saving time and money while increasing productivity.

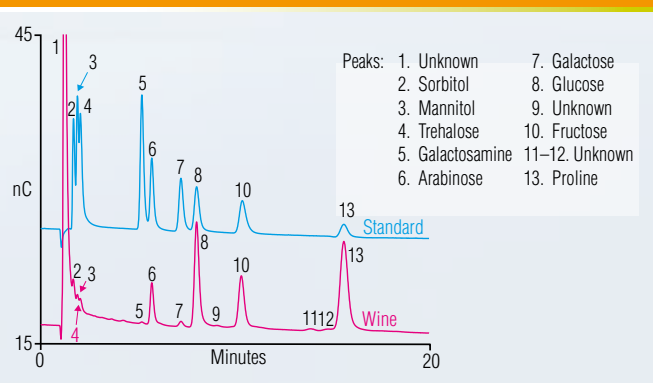


Separation of Six Monosaccharides



Six monosaccharides have been separated in this dietary supplement, and glucosamine, an amino sugar that occurs naturally in the human body, has been added to promote improved joint function.

Wine Sample and Standard



In the fermentation process of producing wine, the grape sugars break down and convert into ethanol and carbon dioxide. The amount of sugar dictates the final alcohol content of the wine.

Capillary IC—IC on Demand

Redefine the way you work in your laboratory.

Workflow: Traditional IC

Dionex IonPac AS19 Anion-Exchange Column (Anions in Drinking Water)



Workflow: Capillary IC—IC on Demand

Dionex IonPac AS19 Anion-Exchange Column (Anions in Drinking Water)



Save 95 days per year using this simple example.
Capillary IC accelerates and simplifies your workflow.

Food and Beverage Capillary IC Applications

www.Dionex.com/Food-Bev-Cap-IC-Apps

Analysis of Apple Juice Using the IonSwift MAX-100 Column and ICS-5000 System
Analysis of Beer Sample Using IonSwift MAX-100 Column and ICS-5000 System
Anion Determination in a Carbonated Fruit-Flavored Beverage Using a Dionex IonPac AS19 Capillary Column
Anion Determination in a Diet Cola Beverage Using a Dionex IonPac AS19 Capillary Column
Anion Determination in a Low-Carbohydrate Sports Beverage Using a Dionex IonPac AS19 Capillary Column
Anion Determinations of a Young Coconut Water Sample on a Dionex IonSwift MAX-100 Capillary Column
Carbohydrates in Chocolate Syrup
Cation Determinations of a Young Coconut Water Sample Using a Dionex IonPac CS12A Capillary Column
Chromatograms of Six Monosaccharides Obtained with PdH and Ag/AgCl Reference Electrodes
Determination of Alditol and Disaccharides
Determination of Anions and Citrate in Bottled Water by Capillary IC
Determination of Inorganic Anions and Organic Acids in Cranberry Juice by Capillary Ion Chromatography
Determination of Inorganic Anions and Organic Acids in Decaffeinated Coffee by Capillary IC
Determination of Inorganic Anions and Organic Acids in Functional Beverages by Capillary Ion Chromatography
Determination of Inorganic Anions and Organic Acids in Tea by Capillary Ion Chromatography
Determination of Mono- and Di-Saccharides
Determination of Perchlorate in Bottled Water Samples Using a 2-D Reagent-Free IC System
Determination of Tartrate and Inorganic Anions by Capillary IC-MS/MS
Determination of Trace Bromate in a Bottled Water Sample Using an ICS-5000 2D Capillary RFIC System
Determinations of Carbohydrates in Cranberry and Orange Juices
Fast Analysis of Apple Juice Using IonSwift MAX-100 Column and ICS-5000 System
Fast Separation of 7 Anions on a Capillary IonPac AS18-Fast Column
Fast Separation of Six Cations on a Capillary IonPac CS12A-5 µm Column
Fruit Juice Profiles (Sugar Analysis)
Gradient Separation of Coffee Sugars
Important Sugar Alcohols, and Mono- and Disaccharides in Dietary Fiber
Inorganic Anion Determination in Bottled Water Using the Dionex IonPac AS19 Capillary Column
Inorganic Anions and Organic Acids in Cola by Capillary Ion Chromatography
Inorganic Cation Determination in Bottled Drinking Water Using the Dionex IonPac CS12A Capillary Column
Inorganic Cation Determination in Sports Drinks Using the Dionex IonPac CS12A Capillary Column
Separation of 22 Anions on a Capillary AS19 Column
Separation of Coffee Sugars
Separation of Organic Acids and Inorganic Anions Using the IonSwift MAX-100 Capillary Column
Separation of Six Monosaccharides
Separation of the Six Cation Standard on a Capillary IonPac CS16 Column
Wine Sample and Standard

www.Dionex.com/ICS-5000-Cap-Reagent-Free-IC-System



Thermo Scientific Dionex products are designed, developed, and manufactured under an ISO 9001 Quality System.

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