Thermo Scientific Dionex Integrion HPIC System
Enhancing Automated Sample Preparation for Trace Determinations

Product Spotlight

The Thermo Scientific™ Dionex™ Integrion™ HPIC™ system offers ease of use for routine ion chromatography (IC) applications. The auxiliary valve of the Dionex Integrion system facilitates the automation of advanced IC sample preparation such as matrix elimination, inline filtration, and preconcentration. The Thermo Scientific™ Dionex™ EWP Electrolytic Water Purifier can be added to perform trace analysis using the auxiliary power of the Dionex Integrion system. Automated sample preparation provides more accurate results and may reduce system maintenance.

Trace Analysis – Down to the Parts-Per-Billion and Parts-Per-Trillion Range

Determining anions and cations at concentrations lower than 500 ppt presents unique challenges with respect to sample preparation and contamination. As analyses require lower detection limits, environmental factors, material compatibility, and contamination are increasingly problematic.

The Dionex Integrion IC system addresses this challenge with the Thermo Scientific™ Dionex™ Reagent-Free™ Electrolytic Sample Preparation (RFIC™-ESP) system that uses the EWP Electrolytic Water Purifier to convert the conductivity cell effluent into ultrapure water. This state-of-the-art combination facilitates reliable trace analysis by combining large volume sampling with automated sample preparation and simplifies trace analysis.

The instrument uses a series of automated steps to prepare standards and samples online. The Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System (CDS) software manages the automation and drives the programming automatically to:

• Calibrate the IC system

• Concentrate and analyze the samples

Thereby,

• Freeing the analyst from performing manual sample preparation and standard dilution

• Minimizing contamination that can interfere with trace analysis

• Improving consistency by eliminating periodic and random contamination

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Typically, calibration requires dilution of standards to establish a calibration curve. With RFIC-ESP, manual dilutions are no longer required. A calibration curve is automatically generated using accurately timed valve toggles to load standards from a single stock standard solution. Through precise software control and accurate hardware timing, the Dionex Integrion IC system calibration curves with coefficients of determination of 0.999 are routinely observed.

Sample analysis is accomplished by drawing the sample into the 10 mL loop and diverting it to a concentrator column, where it is then injected onto the analytical column. The sample is never exposed to pump seals or other contaminants, so detection limits are greatly improved.
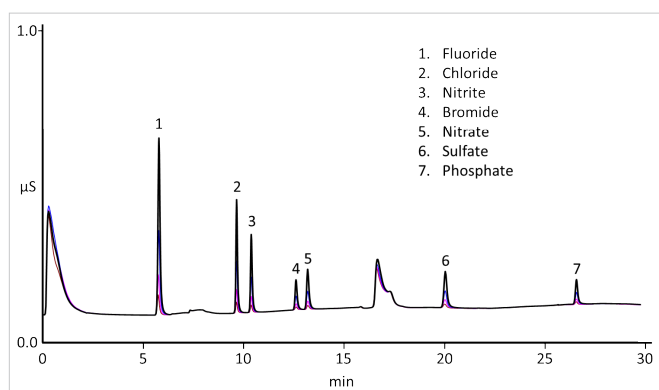

1. Fluoride
2. Chloride
3. Nitrite
4. Bromide
5. Nitrate
6. Sulfate
7. Phosphate

Figure 1: Overlay of calibration standards (50 to 400 ppt) for the above anions.
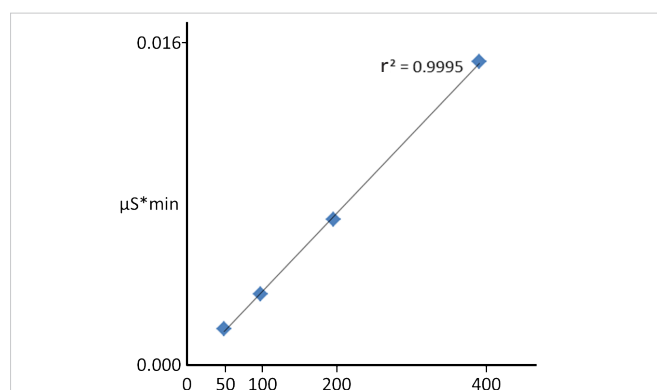

$r^2 = 0.9995$

Figure 2: Calibration curve for bromide at ppt concentrations. Curves generated using the instrument show excellent linearity.
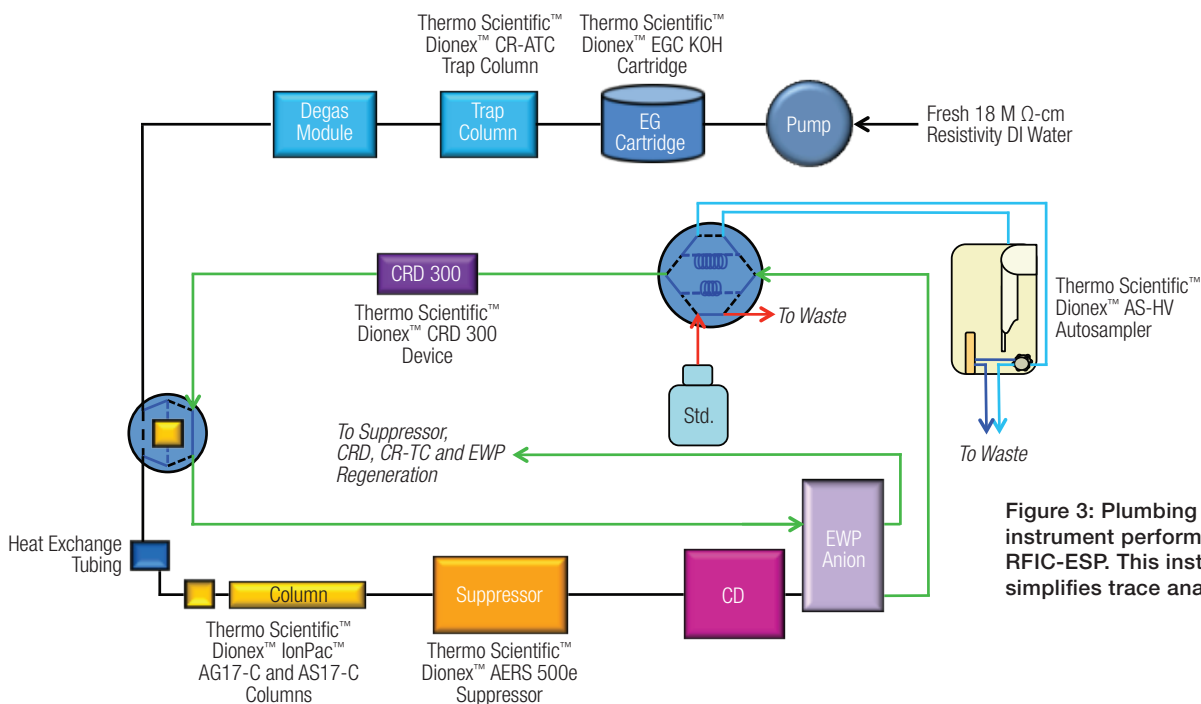

Figure 3: Plumbing schematics of an anion instrument performing trace analysis using RFIC-ESP. This instrument facilitates and simplifies trace analysis.

For more information, visit thermoscientific.com/Integrion

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