

CONFIDENCE in Trace Analysis of Contaminants using IC-MS Solutions



**Dionex
ICS-2100 RFIC System**

- Just add water
- Integrated design
- High analytical specificity
- U.S. EPA methods specify IC-MS



**Thermo Scientific
MSQ Plus Mass Detector**

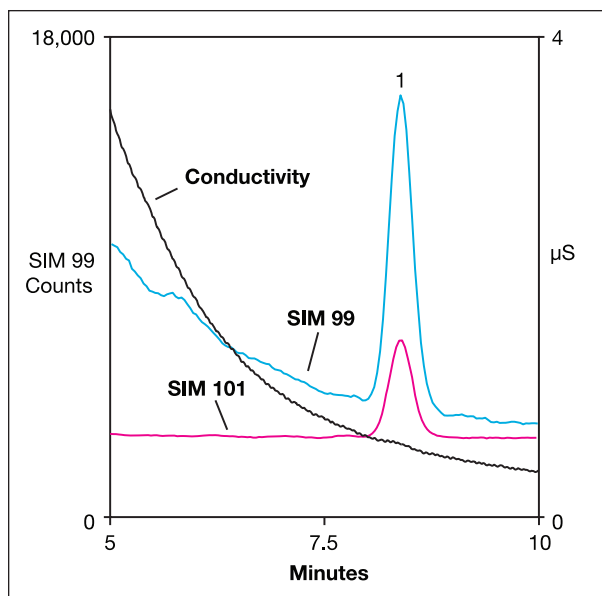
- Superior ESI design for low mass ions
- Rapid screen and target compound analysis
- High stability and minimal drift
- High sensitivity due to specially enhanced transmission efficiency for low mass ions

Trace analysis for environmental samples is especially challenging since it requires sensitive detection but also removal of matrix interferences. Ion exchange chromatography coupled with mass detection is an ideal solution for many critical contaminants. The specificity and selectivity of ion exchange has a greater resolving power for ionic contaminants than reversed phase separations.

Ion Chromatography (IC) and Reagent Free IC (RFIC) were developed primarily for the separation of anions and cations through ion exchange based separations using conductivity detection. Conversely, Mass Spectrometry (MS) methods have been developed for the analysis of organic compounds using reversed phase separations that provide simultaneous mass accuracy and confirmation. The resolving power of reversed phase separations of ionic or mixed mode species is limited given that it does not take advantage of anion- or cation exchange selectivities. Additionally, high ionic strength matrices also cause significant signal suppression in the mass detector. A strategy often applied is the use of ion pairing agents and ionic compounds containing a hydrocarbon chain that imparts a certain hydrophobicity forcing ion pair retention on a reversed-phase column. However, ion pairing agents are typically strong acids, with potential to damage the

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EPA Method 332.0 for Perchlorate by IC-MS

ESI source within the MS detector or causing signal suppression. For these reasons, the coupling of ion exchange with MS detection has been problematic in the past.

Fortunately, there is an IC-MS solution to overcome many of these separation and detection challenges. By deploying RFIC with high capacity anion exchange separation, you gain premier technology for ease-of-use, improved gradient separations and low level detection. The wide range of Dionex IonPac column choices increase your capacity and selectivity to resolve trace analytes in very

challenging matrices. For example, a high column capacity allows the separation of trace contaminants in the presence of high amounts of interfering anions. During the separation, the eluent can be diverted to waste to remove interfering ions prior to detection. This improves the detection limits for the trace analyte contaminant. The continuously regenerated suppressors desalt the mobile phase to minimize ion suppression and ensure similar response factors even at different chromatographic conditions.

Common IC-MS Applications

- Detecting anionic contaminants in water matrices
- Determination of trace bromate in drinking water
- Trace perchlorate in drinking water, milk and food samples
- Measurement of haloacetic acids (HAA) in drinking water

IC-MS Solution

Fully integrated IC-MS workflow from sample prep to results in a comprehensive, value-priced package:

- Dionex ICS-2100 Reagent-Free Ion Chromatography (RFIC) system
- Dionex AS-DV autosampler
- MSQ Plus mass detector
- Dionex Chromeleon 6.8 CDS software including MS software
- Single source for consumables, parts, upgrades, service and technical support

For product specifications, application notes and more, please visit www.thermoscientific.com, www.thermoscientific.com/dionex or email us at analyze@thermofisher.com

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