

Trace Anion Analysis in Ultrapure Water Using an Electrolytic Water Purifier with a Compact Ion Chromatography System

Daniel Khor, Terri Christison, and Jeff Rohrer, Thermo Fisher Scientific, Sunnyvale, CA, USA

Key Words

Integriion, IonPac AS17-C, EGC 500, Suppressed Conductivity, EWP Electrolytic Water Purifier, AutoPrep

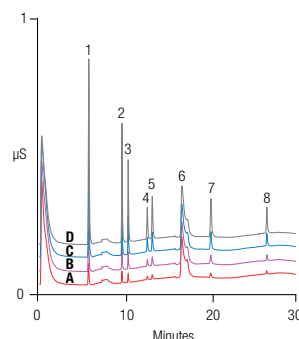
Introduction

Determinations of trace anions in ultrapure water are important to the electronics industry. This application proof note demonstrates determinations of ng/L (ppt) anions using large volume concentration with the Thermo Scientific™ Dionex™ EWP Electrolytic Water Purifier and AutoPrep™ modules. Calibration standards are prepared using the AutoPrep large and small loops and EWP-purified water diluent, thereby increasing sensitivity by eliminating sources of contamination. In this proof note, trace anions are separated using a Thermo Scientific™ Dionex™ Integriion™ compact ion chromatography system and an IonPac AS17-C column designed to improve low level sulfate determinations.

Method

IC System:	Thermo Scientific Dionex Integriion RFIC system with column heater		
Columns:	Thermo Scientific Dionex IonPac AG17-C Guard (4 × 50 mm) Thermo Scientific Dionex IonPac AS17-C Analytical (4 × 250 mm) Thermo Scientific Dionex IonPac UTAC-LP2 Ultratrace Anion Concentrator Column (4 × 35 mm)		
Eluent:	Potassium hydroxide		
Gradient:	Retention Time [min]	Flow [mL/min]	Concentration [mM]
	0.0	1.0	1.0
	4.0	1.0	1.0
	10.0	1.0	12.5
	20.0	1.0	20.0
	30.0	1.0	35.0
	35.1	1.0	50.0
	39.5	1.0	50.0
	39.6	1.0	1.0
	46.5	1.0	1.0
Flow Rate:	1.0 mL/min		
Injection Volume:	10 mL for samples; 10–80 µL for standards		
Temperature:	30 °C		
Detector Compartment:	15 °C		
Detection:	Suppressed conductivity, Thermo Scientific™ Dionex™ AERS™ 500 Electrolytically Regenerated Suppressor, 4 mm, 87 mA, recycle mode		

For application support, visit the [AppsLab Library](http://www.thermoscientific.com/appslib) where you can find detailed method information, chromatograms and related compound information. All the information needed to run, process and report the analysis is available in ready-to-use eWorkflows, which can be executed directly in your chromatography data system. www.thermoscientific.com/appslib



Columns:	Dionex IonPac AG17-C, 4 × 50 mm Dionex IonPac AS17-C, 4 × 250 mm
KOH Eluent:	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 KOH cartridge, with Dionex CR-ATC 600 trap column, Dionex high pressure degasser
Flow Rate:	1 mL/min
Inj. Volume:	Sample (10 mL), Standard (10–80 µL)
Column Temp.:	30 °C
Detection:	Suppressed conductivity, Dionex AERS 500, 4 mm, 109 mA, recycle 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)
Samples:	A: 50 ng/L C: 200 ng/L B: 100 ng/L D: 400 ng/L
Peaks:	1. Fluoride 5. Nitrate 2. Chloride 6. Carbonate 3. Nitrite 7. Sulfate 4. Bromide 8. Phosphate

Reference

1. Thermo Scientific Dionex Application Brief 106: Trace Anion Analysis Using an ICS-2100 System with RFIC-ESP and an Electrolytic Water Purifier. Sunnyvale, CA [Online] <http://www.thermoscientific.com/content/dam/tfs/ATG/CMD/CMD%20Documents/Application%20&%20Technical%20Notes/Chromatography/Ion%20Chromatography/IC%20and%20RFIC%20Systems/82068-AB106-IC-TraceAnion-16Oct2009-LPN2322.pdf> (accessed Jan. 12, 2016)

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