Waters™

應用手冊

EPA Method 331.0 Determination of Perchlorates in Drinking Water by Liquid Chromatography Electrospray Ionization Mass Spectrometry

Waters Corporation



This is an Application Brief and does not contain a detailed Experimental section.

Abstract

This application brief demonstrates the determination of perchlorates in drinking water by Liquid

Chromatography Electrospray Ionization Mass Spectrometry.

Introduction

Perchlorate is both naturally occurring and man-made. In its natural form, perchlorate is a contaminant in

fertilizers. Man-made perchlorate is used in a wide variety of industrial applications including the production of

rubber and paint, in lubricants, and as a primary ingredient in solid rocket propellant. Perchlorate is highly water

soluble and can migrate into groundwater and surface water, posing a concern to drinking water supplies. Thirty-

five states have detected perchlorate in drinking water at higher levels than expected. The United States

Environmental Protection Agency (US EPA) has established an official reference of 0.0007 ppb per day of

perchlorate. Maryland, Massachusetts, and New Mexico have established a one part per billion (ppb) action limit,

while California and Texas have established 4 ppb limits.

Experimental

HPLC Conditions

Waters Alliance HPLC and Conductivity DSetector

Eluent:

Instrument:

25 mM ammonium bicarbonate, pH = 10 in 50%

acetonitrile

Column:

Waters IC-Pak A/HR, 4.6 x 150 mm, 7 μm @ 30 °C

2

Injection:

100 μL

Flow Rate:

0.5 mL/min

EPA Method 331.0 Determination of Perchlorates in Drinking Water by Liquid Chromatography Electrospray Ionization Mass Spectrometry

Data:	Waters MassLynx Software	
MS Conditions		
Instrument:	Waters TQ Detector or Quattro micro API Mass Spectrometer	
Ion Mode:	Electrospray negative (ESI-)	
Mode:	Multiple reaction monitoring (MRM). The MRM transitions, cone voltages (CV) and collision	

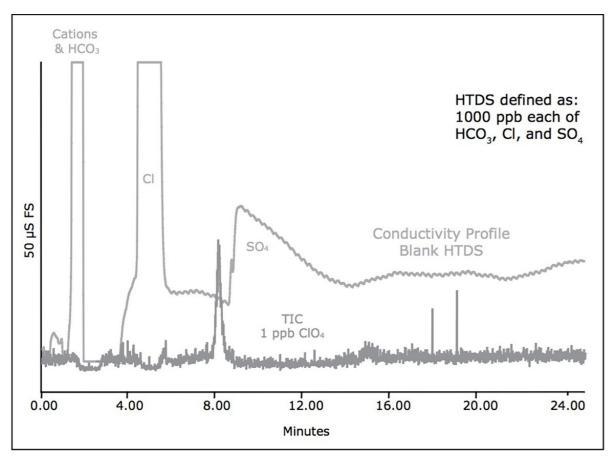
Compound	MRM Transition	CV	CE
Perchlorate (quantification)	99.1>82.7	40	30
Perchlorate (confirmation)	101.1>84.7	40	30
Internal Standard (Cl1804-)	107.1>88.7	40	30

energies (CE) are listed below.

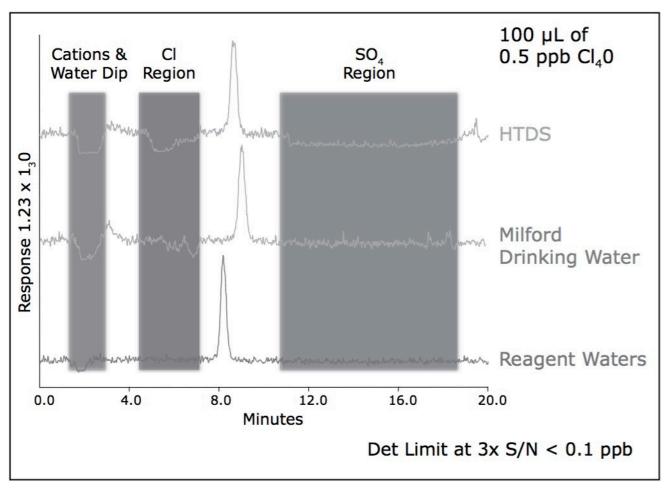
Optimized MRM transition parameters for EPA method 331.0 in ES-.

Sample Preparation

No sample pretreatment. Add internal standard.



1 ppb perchlorate in HTDS.



0.5 ppb perchlorate detection in three different sample matrices by LC-MS/MS. Analyzed on consecutive days with fresh eluent.

Related Literature	Literature Code	
Environmental System Solutions	720001601EN	
The Determination of Perchlorate in Water Using LC/MS/MS	720000941EN	
The Determination of Perchlorate in Drinking Water	720001285EN	
Using Single Quadrupole Mass Spectrometry		

www.waters.com/library

Featured Products

Alliance	HPI C System	<https: r<="" th=""><th>www.waters.com/</th><th>/534293></th></https:>	www.waters.com/	/534293>

· MassLynx MS Software https://www.waters.com/513662

720002725, August 2008



© 2021 Waters Corporation. All Rights Reserved.