EPA METHOD

PERCHLORATES

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

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

HPLC CONDITIONS

Instrument:	Waters Alliance® HPLC and conductivity detector
Eluent:	25 mM ammonium bicarbonate, pH = $10 in 50%$ acetonitrile
Column:	Waters IC-Pak™ A/HR, 4.6 x 150 mm, 7 µm @ 30 °C
Injection:	100 μL
Flow Rate:	0.5 mL/min
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 energies (CE) are listed below.

Compound	MRM Transition	C۷	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

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

SAMPLE PREPARATION

No sample pretreatment. Add internal standard.







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

ORDERING INFORMATION

Related Parts	Part Number
IC-Pak Anion HR, 7 µm, 4.6 x 150 mm	WAT26770
Perchlorate Standard	186004155
Perchlorate CRM	186004253
LC/MS Certified Vials	see catalog
Related Literature	Literature Code
Related Literature	Literature Code
Related Literature Environmental System Solutions	Literature Code 720001601EN
Related Literature Environmental System Solutions The Determination of Perchlorate in Water Using	Literature Code 720001601EN 720000941EN
Related Literature Environmental System Solutions The Determination of Perchlorate in Water Using LC/MS/MS	Literature Code 720001601EN 720000941EN
Related Literature Environmental System Solutions The Determination of Perchlorate in Water Using LC/MS/MS The Determination of Perchlorate in Drinking Water	Literature Code 720001601EN 720000941EN 720001285EN

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