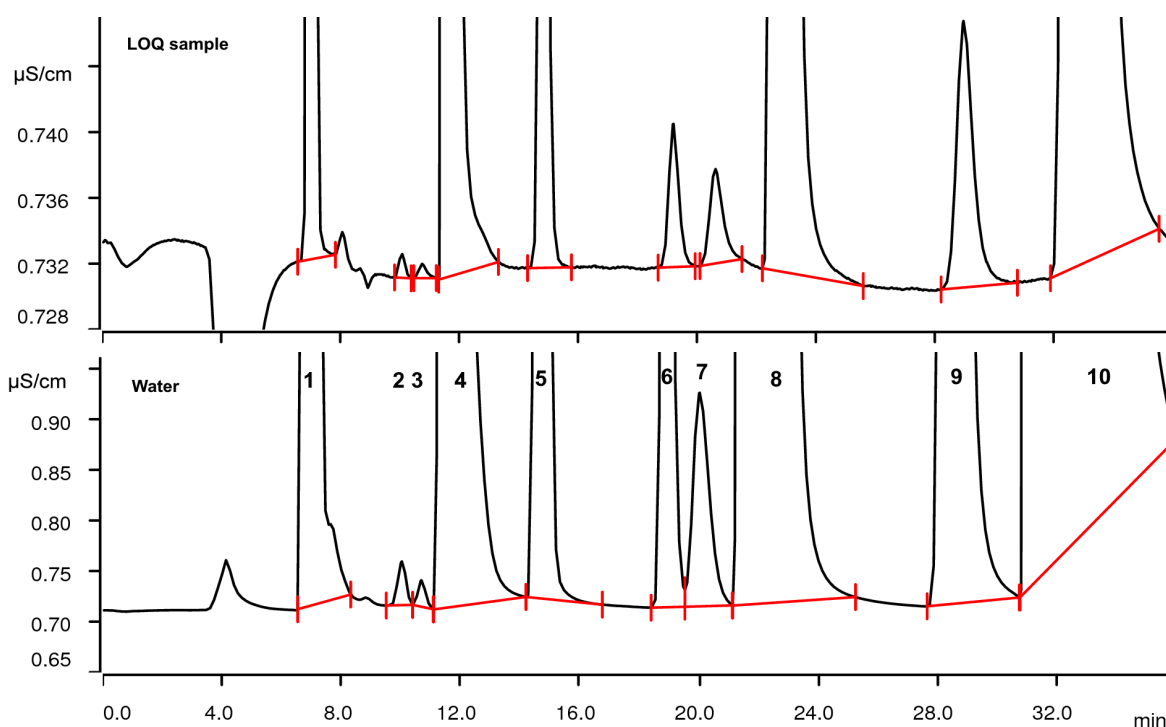


Bromate in water with conductivity detection: optimized separation and LOQ



Determination of disinfection by-products in water is a standard application for ion chromatography (EPA Method 300.1). Applying conductivity detection the separation of chlorite and bromate from chloride is crucial for $\mu\text{g/L}$ detection limits. The combination of a Metrosep A Supp 7 - 250/4.0 and a Metrosep A Supp 16 Guard/4.0 leads to an improved separation. The Limit of Quantification for bromate is around 1 $\mu\text{g/L}$.

Results

Anion*	Conc. water [mg/L]	Conc. LOQ [$\mu\text{g/L}$]	RSD [% , N = 11]
2 Chlorite	0.37	1.04	7.6
3 Bromate	0.37	0.94	8.8
4 Chloride	98.10	974.0	0.19

* other results see next page; LOQ = standard solution with concentrations of oxyhalides at quantification limit

Sample

Water, LOQ sample

Sample preparation

Direct injection after Inline Ultrafiltration applying Intelligent Partial-Loop Injection technique.

Columns

Metrosep A Supp 7 - 250/4.0	6.1006.630
Metrosep A Supp 16 Guard/4.0	6.1031.500

Solutions

<u>Eluent</u>	3.2 mmol/L sodium carbonate 1.0 mmol/L sodium hydrogen carbonate
Regenerant	300 mmol/L phosphoric acid
Rinsing	STREAM

Instrumentation

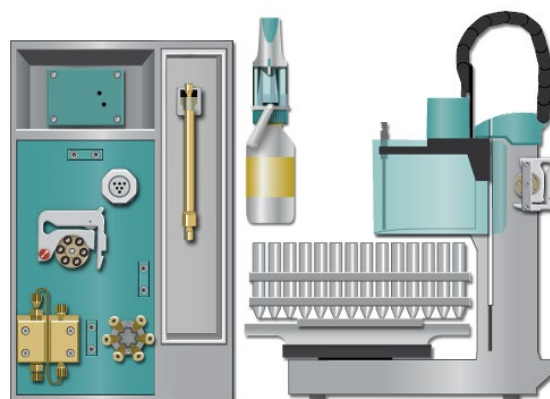
930 Compact IC Flex Oven/SeS/PP/Deg	2.930.2560
IC Conductivity Detector	2.850.9010
858 Professional Sample Processor	2.858.0020
MSM Rotor A	6.2832.000
Adapter sleeve for Suppressor Vario	6.2842.020
Dosino	2.800.0010
IC equipment: Ultrafiltration	6.5330.110
IC equipment: MiPT	6.5330.180

Analysis

Conductivity detection after sequential suppression

Parameters

Flow rate	0.7 mL/min
Injection volume	100 µL
P _{max}	15 MPa
Recording time	30 min
Column temperature	45 °C
Run time	36 min



Results of the other ions

Sample	Conc. water [mg/L]	Conc. LOQ [µg/L]	RSD [%, N = 11]
1 Fluoride	4.74	30.0	0.47
5 Nitrite	2.92	40.0	0.41
6 Bromide	0.99	9.4	1.34
7 Chlorate	0.38	9.6	4.15
8 Nitrate	97.06	9.9	0.16
9 Phosphate	11.28	50.0	1.26
10 Sulfate	378.0	3904	0.19

LOQ = standard solution with concentrations of oxyhalides at quantification limit

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