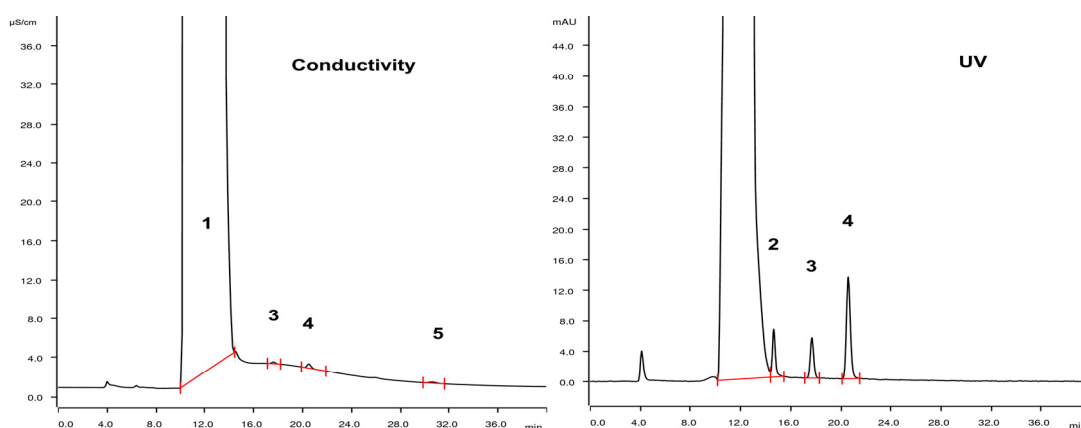


Anions in high ionic water by IC using tandem conductivity and UV detection

Method qualification for ASTM D8234 applying the Metrosep A Supp 7 - 250/4.0 in combination with a Metrosep A Supp 16 Guard/4.0



Chromatograms of the spiked 3% sodium chloride solution (left – conductivity detection, right – UV/VIS detection). Injected sample volume: 10 µL.

«High ionic water» is typically water containing a high concentration of chloride (e.g. seawater, brine), but this also describes water samples resulting from petrochemical processes. Due to the high chloride concentrations, the conductivity determination of minor ionic components is limited. Thus, minor anions like nitrite, bromide, and nitrate can elute under or on the tail of the large chloride peak, and their detection in low concentrations is hampered. However, combining conductivity and UV/VIS detection as described in ASTM D8234 enables the determination of anions that are UV active. Chloride does not interfere in this situation. The described technique enables the interference-free simultaneous determination of trace anions besides high chloride content.

Results

	Conductivity		UV detection		
	1 Chloride	5 Sulfate	2 Nitrite-N	3 Bromide	4 Nitrate-N
Mean	30789	0.115	0.086	0.102	0.090
Std. dev.		0.0044	0.0028	0.0080	0.0033
MDL		0.0143	0.0091	0.0258	0.0108

All results in mg/L.

Sample

3% sodium chloride solution spiked with 0.1 mg/L each of nitrite, bromide, nitrate, and sulfate.

Sample preparation

None

Columns

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

IC Solutions

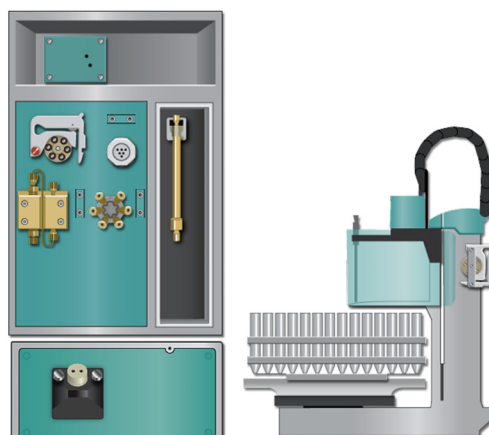
Eluent	3.2 mmol/L sodium carbonate 1.0 mol/L sodium hydrogen carbonate 2% acetonitrile
Regenerant Dosino	100 mmol/L sulfuric acid 10% acetonitrile
Rinsing	10% acetonitrile in ultrapure water

Instrumentation

940 Professional IC Vario ONE/SeS/PP	2.940.1500
IC Conductivity Detector	2.850.9010
944 Professional UV/VIS Detector Vario	2.944.0010
858 Professional Sample Processor	2.858.0020
MSM-HC Rotor A	6.2842.000
IC equipment: Inline Ultrafiltration	6.5330.110

Analysis

Conductivity detection after sequential suppression and UV/VIS detection in series



Parameters IC

Flow rate	0.7 mL/min
Injection volume (MiPT)	10–200 µL
P _{max}	15 MPa
Column temperature	45 °C
Run time	35 min

Parameters UV/VIS

Wavelength	210 nm
Measuring duration	500 ms