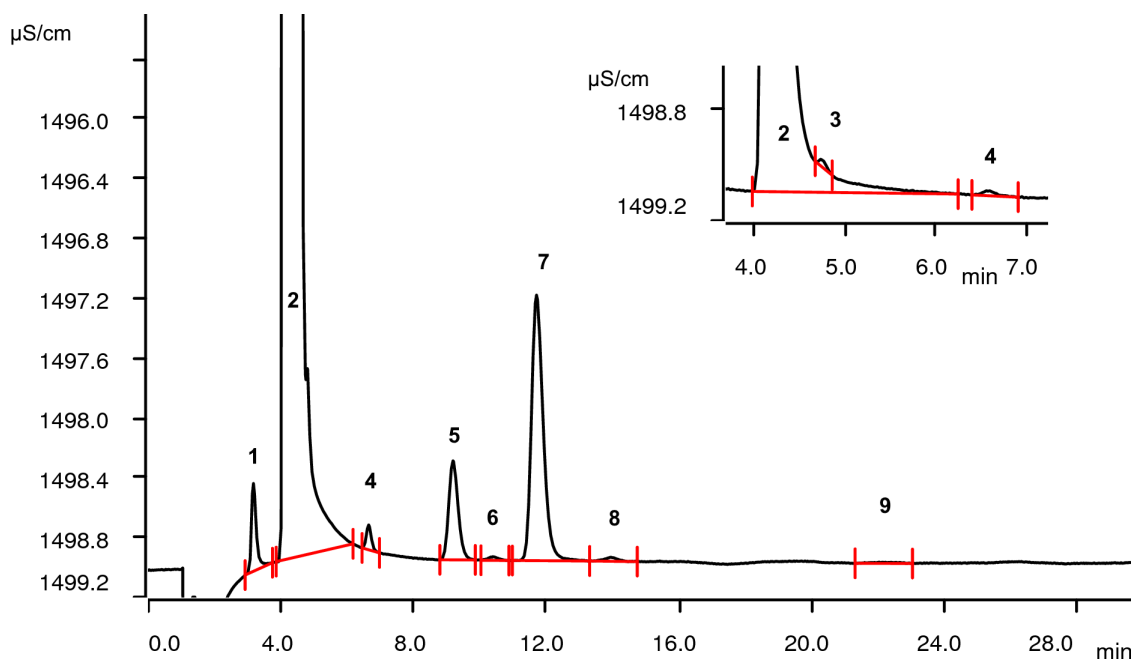


Cations in sodium rich wastewater

Determination of lithium, ammonium, zinc, strontium, and barium in sodium-rich wastewater with the Metrosep C 6 - 150/4.0



Chromatogram of a wastewater sample diluted 1:10 showing the determination of cations beside a large concentration of sodium (2). The insert shows a section the same sample with a 100-fold dilution, enabling the quantification of ammonium (3) on top of the sodium shoulder.

Wastewaters often contain high loads of sodium, making the determination of minor cations quite a challenge. In the present wastewater study, the determination of lithium, ammonium, zinc, strontium, and barium is requested. If the sodium concentration exceeds 2 g/L, this negatively influences the peak shape of closely eluting peaks. Applying an appropriate dilution factor to the sample enables the quantification of minor cations. Therefore zinc and barium can be properly quantified with a dilution ratio of 1:2, while lithium and ammonium require minimum dilution factors of at least 1:10 and 1:100, respectively.

Results

	Cation / dilution factor	Conc. [mg/L]	RSD [%]		Cation / dilution factor	Conc. [mg/L]	RSD [%]
1	Lithium / 10	1.66	2.2	6	Zinc / 2	0.49	0.2
2	Sodium / 100	2145	0.2	8	Strontium / 10	0.96	5.1
3	Ammonium / 100	1.67	2.9	9	Barium / 2	n.d.	-

n.d. = not detected. Potassium (4), magnesium (5) and calcium (7) are not quantified.

Sample

Sodium-rich wastewater.

Sample preparation

The wastewater is diluted 1:2, 1:10, or 1:100, respectively, in 2 mmol/L nitric acid.

Cation columns

Metrosep C 6 - 150/4.0	6.1051.420
Metrosep C 6 Guard/4.0	6.1051.500

Solutions

Eluent	4.0 mmol/L nitric acid
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Instrumentation

Eco IC	2.925.0020
IC Conductivity Detector	2.850.9010
863 IC Compact Autosampler	2.863.0010

Analysis

Direct conductivity detection

Parameters

Flow rate	0.9 mL/min
Injection volume	10 μ L
P _{max}	20 MPa
Column temperature	ambient
Recording time	30 min

