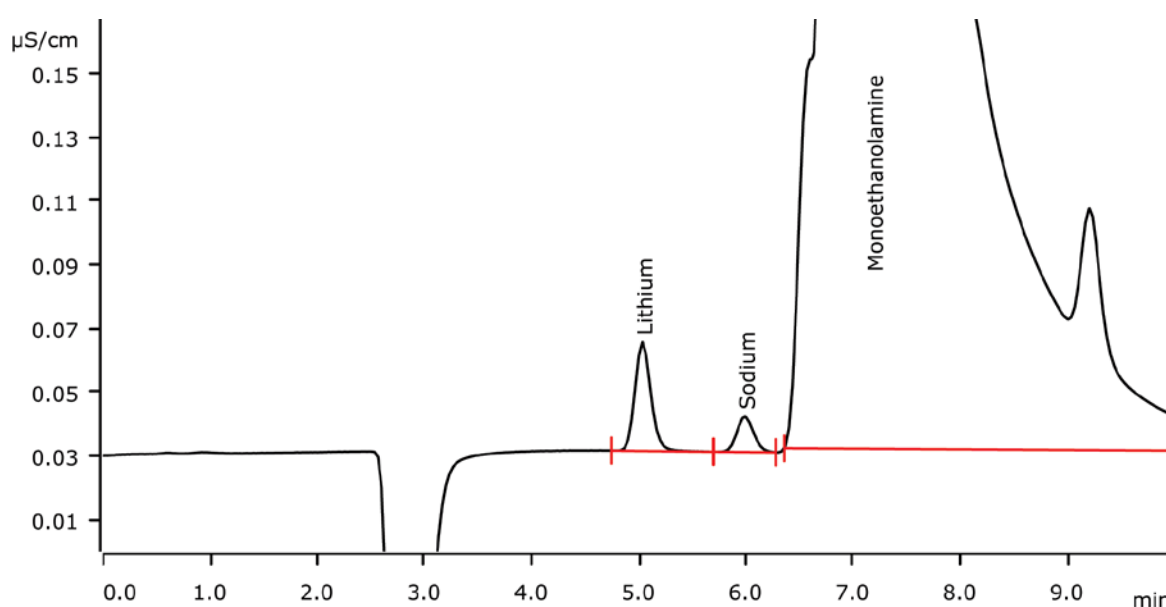


Traces of lithium and sodium besides monoethanolamine in water-steam circuits of thermal power plants



Boiler feed water is the operating medium in thermal power plants. To suppress corrosion, the pH value of the feed water is adjusted with amines. Their addition has to be regularly controlled. Besides, the monitoring of the sodium concentration is crucial, since an increase probably points to infiltrating cooling water caused by a leak in the condenser. Ion chromatography with conductivity detection after sequential suppression is a powerful monitoring tool, especially when combined with the intelligent Preconcentration Technique and Matrix Elimination.

Results

Cation	Concentration [µg/L]	RSD [% , n = 6]
Lithium	0.5	0.7
Sodium	0.5	1.3
Monoethanolamine	4000	-

Sample

Synthetic circuit water

Sample preparation

The sample is injected applying Metrohm intelligent Preconcentration technique with Matrix Elimination (MiPCT-ME).

Columns

Metrosep C Supp 1 - 250/4.0	6.1052.430
Metrosep C Supp 1 Guard/4.0	6.1052.500
Metrosep C PCC 1 HC/4.0	6.1010.310

Solutions

Eluent	4.0 mmol/L nitric acid 200 µg/L rubidium
Suppressor regenerant	70 mmol/L sodium carbonate 70 mmol/L sodium hydrogen carbonate
Rinsing solution	STREAM

Analysis

Conductivity detection after sequential suppression

Instrumentation

940 Professional IC Vario ONE/SeS	2.940.1400
IC Conductivity Detector	2.850.9010
858 Professional Sample Processor	2.858.0010
3 x 800 Dosino	2.800.0010
941 Eluent Preparation Module	2.941.0010
ELGA PURELAB® Flex 6	
MSM-HC Rotor C	6.2842.200
Coated steel needle	6.2624.200
IC equipment: MiPCT-ME	6.5330.160
IC equipment: Dosino regeneration	6.5330.190

Parameters

Flow rate	1.0 mL/min
Injection volume (MiPT)	1000 µL
P _{max}	15 MPa
Recording time	10 min
Column temperature	40 °C

Calibration MiPCT-ME

Calibration range	Factor of 40
Standard solution:	
All cations	40 µg/L
1. Level	4000 µL = 40 µg/L (not applied)
2. Level	1000 µL = 10 µg/L
3. Level	200 µL = 2 µg/L
4. Level	50 µL = 0.5 µg/L
5. Level	10 µL = 0.1 µg/L
6. Level	5 µL = 0.05 µg/L
7. Level	2.5 µL = 0.025 µg/L



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