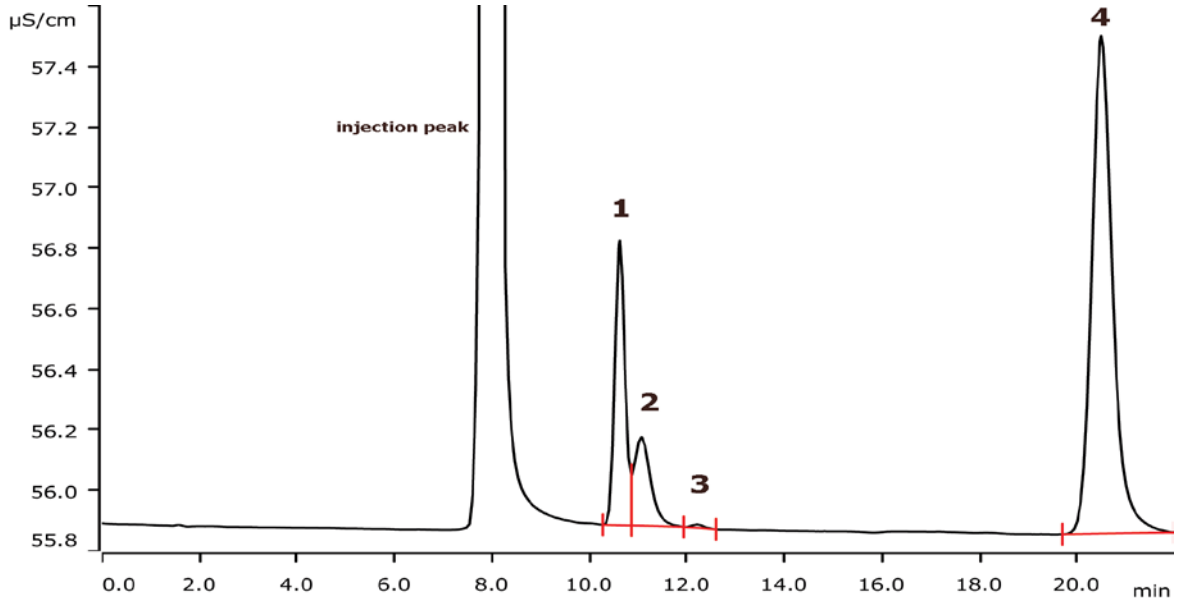
IC Application Note O–44

# Boron in fluoridated drinking water by ion-exclusion chromatography with inverse suppression




The human daily intake of boron from food and beverages is approximately 2 mg. This is far below any toxic level. Some plants, however, are extremely sensitive to boron concentrations above 1 mg/L, e.g., strawberries, blackberries. As seawater contains 4 to 5.5 mg/L of boron, desalination is required to remove surplus boron besides other ions. This note shows the determination of boron (as borate) by ion-exclusion chromatography with conductivity detection after inverse suppression. The method has been optimized to get a sufficient fluoride/borate separation.

## Results

| | | Concentration [mg/L] | RSD [%, n = 3] |
|---|---|---|---|
| 1 | Fluoride | n.q. | - |
| 3 | Boron | 0.012 | 6 |
| 4 | Silicate | n.q. | - |

Peak 2 in an unknown component

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## Sample

Fluorinated drinking water.

## Sample preparation

Direct injection.

## Columns

| | |
|---|---|
| Metrosep Organic Acids - 250/7.8 | 6.1005.200 |
| Metrosep RP 2 Guard/3.5 | 6.1011.030 |

## Solutions

| | |
|---|---|
| Eluent | 0.3 mmol/L sulfuric acid<br>100 mmol/L mannitol |
| Suppressor regenerant | 100 mmol/L lithium chloride |
| Rinsing solution | Ultrapure water |

## Analysis

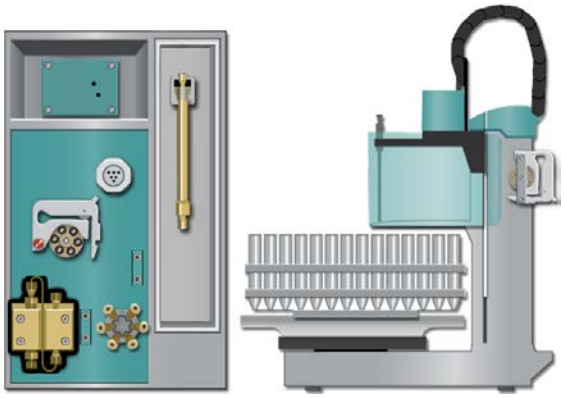
| |
|---|
| Conductivity detection after inverse suppression |

## Parameters

| | |
|---|---|
| Flow rate | 0.5 mL/min |
| Injection volume | 20 µL |
| $P_{max}$ | 7 MPa |
| Recording time | 22 min |
| Column temperature | 30 °C |

## Instrumentation

| | |
|---|---|
| 930 Compact IC Flex Oven/ChS/PP/Deg | 2.930.2360 |
| 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 |



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