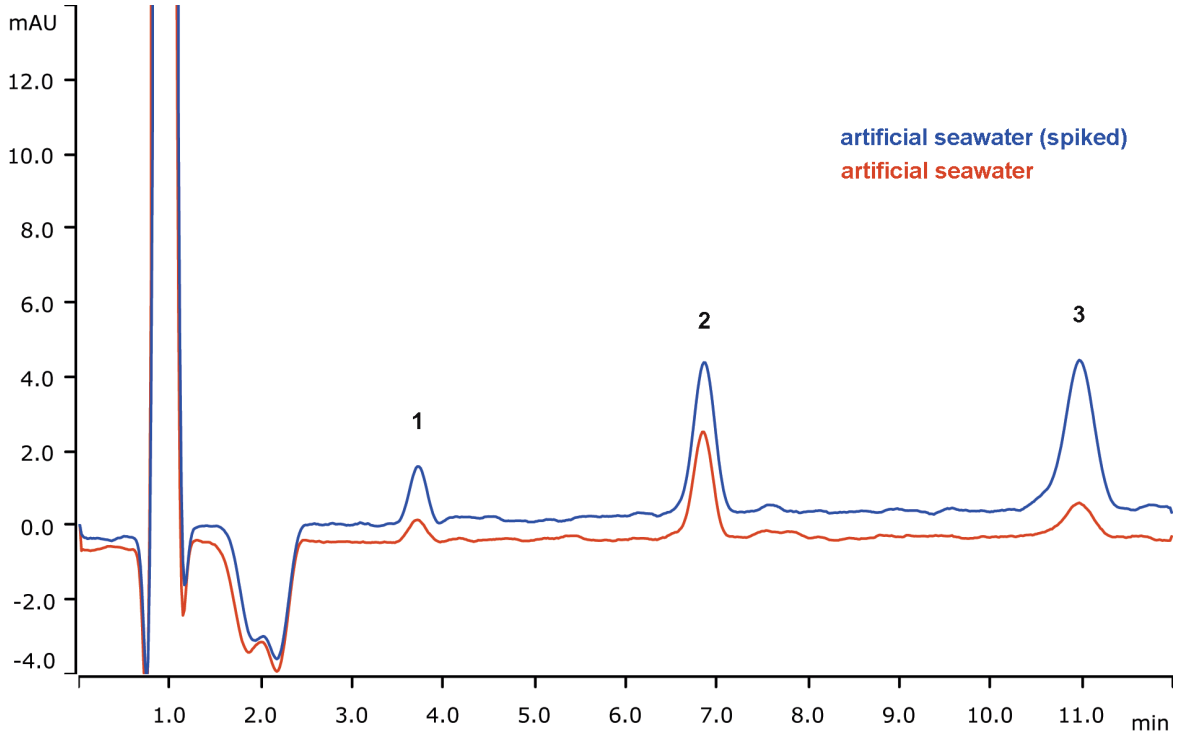
IC Application Note U–71

Nitrite, bromide, and nitrate in artificial seawater applying UV/VIS detection



Ion chromatographic trace analysis of anions in seawater is difficult due to the very high chloride concentration. Nitrite, bromide, and nitrate are absorbing UV in the low wavelength range, while chloride does not. This allows UV detection of these three anions. Here, the separation is achieved on a Metrosep Carb 2 - 100/4.0 column with a sodium chloride eluent. This minimizes the influence of the excess of chloride and allows low detection limits.

Results

	Anion	Conc. direct [mg/L]	Conc. spiked [mg/L]	Recovery [%]
1	Nitrite (spike: 0.05 mg/L)	0.034	0.084	100
2	Bromide (spike: 0.25 mg/L)	0.486	0.731	99
3	Nitrate (spike: 0.25 mg/L)	0.088	0.343	102

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Sample

Artificial seawater (28 g NaCl, 7 g $MgSO_4 \cdot 7H_2O$, 5 g $MgCl_2 \cdot 6H_2O$, 2.4 g $CaCl_2 \cdot 6H_2O$, 0.2 g $NaHCO_3$ in 1 L ultrapure water)

Sample preparation

Direct injection.

Columns

Metrosep Carb 2 - 100/4.0	6.1090.410
Metrosep Carb 2 Guard/4.0	6.1090.500

Solutions

Eluent	10 g/L sodium chloride
Suppressor regenerant	500 mmol/L sulfuric acid
Rinsing solution	STREAM

Analysis

Direct UV/VIS detection after chemical suppression

Parameters

Flow rate	1.5 mL/min
Injection volume	50 µL
P_{max}	20 MPa
Recording time	12 min
Column temperature	30 °C
Wavelength	218 nm
Measuring duration	1000 ms

Instrumentation

930 Compact IC Flex Oven/ChS/Deg	2.930.2260
944 Professional UV/VIS Detector Vario	2.944.0010
858 Professional Sample Processor	2.858.0020
800 Dosino	2.800.0010
IC equipment: Dosino regeneration	6.5330.190

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