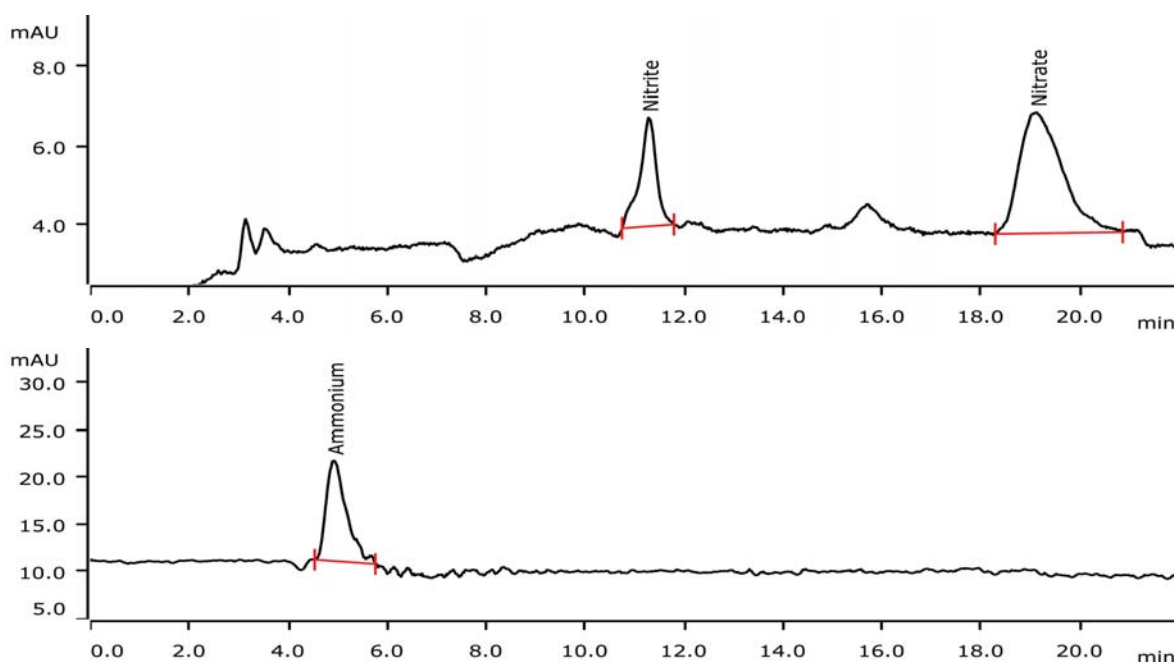


Ammonium, nitrite, and nitrate in artificial seawater applying UV/VIS detection



Total nitrogen determination is possible in one single chromatographic run. Ammonium, nitrite, and nitrate are separated on a Metrosep A Supp 16 - 250/4.0 column applying UV detection, the first with and the latter two without post-column reaction (PCR). In two PCRS, ammonium is transformed to a colored compound, while for nitrite and nitrate analysis, chemical suppression is used before UV/VIS detection.

Results

n = 3	spiked	found	RSD (%)
Ammonium (PCR)	800 µg/kg	797 µg/kg	0.3
Nitrite (direct UV/VIS)	800 µg/kg	797 µg/kg	0.1
Nitrate (direct UV/VIS)	800 µg/kg	915 µg/kg	0.3

Sample

Artificial seawater (28 g NaCl, 7 g MgSO₄·7H₂O, 5 g MgCl₂·6H₂O, 2.4 g CaCl₂·6H₂O, 0.2 g NaHCO₃ in 1 L ultrapure water)

Sample preparation

Direct injection of spiked sample

Columns

Metrosep A Supp 16 - 250/4.0	6.1031.430
Metrosep A Supp 16 Guard/4.0	6.1031.500

Solutions

Eluent	7.5 mmol/L sodium carbonate 0.75 mmol/L sodium hydroxide
Post-column reagent 1	300 mg sodium dichloroisocyanurate 9 mL sodium hydroxide (32%) 1 g trisodium citrate dihydrate (in 250 mL UHP water)
Post-column reagent 2	6 g 1-naphthol 125 mL ethanol 25 mL acetone 100 mL ultrapure water
Suppressor regenerant (Dosino)	1.0 mol/L sulfuric acid
Rinsing solution (Dosino)	Ultrapure water

Analysis

Direct UV/VIS detection after chemical suppression and UV/VIS detection after post-column reaction

Parameters

Flow rate	0.8 mL/min
Flow rate PCR 1	0.3 mL/min
Flow rate PCR 2	0.3 mL/min
Injection volume	20 µL
P _{max}	20 MPa
Recording time	22 min
Column temperature	45 °C
PCR temperature	60 °C
Wavelength (direct)	225 nm
Reference wavelength (direct)	-
Wavelength (PCR)	735 nm
Reference wavelength (direct)	520 nm

Instrumentation

850 Professional IC Anion	2.850.2010
2 × 887 Professional UV/VIS Detector	2.887.0010
886 Professional Reactor	2.886.0110
858 Professional Sample Processor	2.858.0020
800 Dosino	2.800.0010
Dosing Unit 2 mL (MSM regeneration)	6.3032.120



www.metrohm.com

 **Metrohm**

System setup:

After separation, the eluent is split into two streams by a flow splitter (split ratio 1:1). One stream is chemically suppressed before nitrite and nitrate are detected by UV/VIS. In the other stream, ammonium passes through two post-column reactors and enters the UV/VIS detector as a colored component.

