IONUS

Fast determination of anions and cations

mP ION ANALYZER


IONUS

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The ion chromatograph is offered in two different detection variants with regard to different applications. As standard, this is detection by conductivity (IONUS) and for special applications this detector is replaced by post-column derivatization with photometers of different wavelengths in the UV/VIS range (IONUS, Post Column Derivatization) in analogy to our amino acid analyzer ARACUS.

By default, we equip our chromatographs almost exclusively with columns from Hamilton in Stainless Steel and PEEK. Columns from other manufacturers are available for certain special applications and on request. We also develop individual applications for you, which are special tailored to your wishes and your separation problem.

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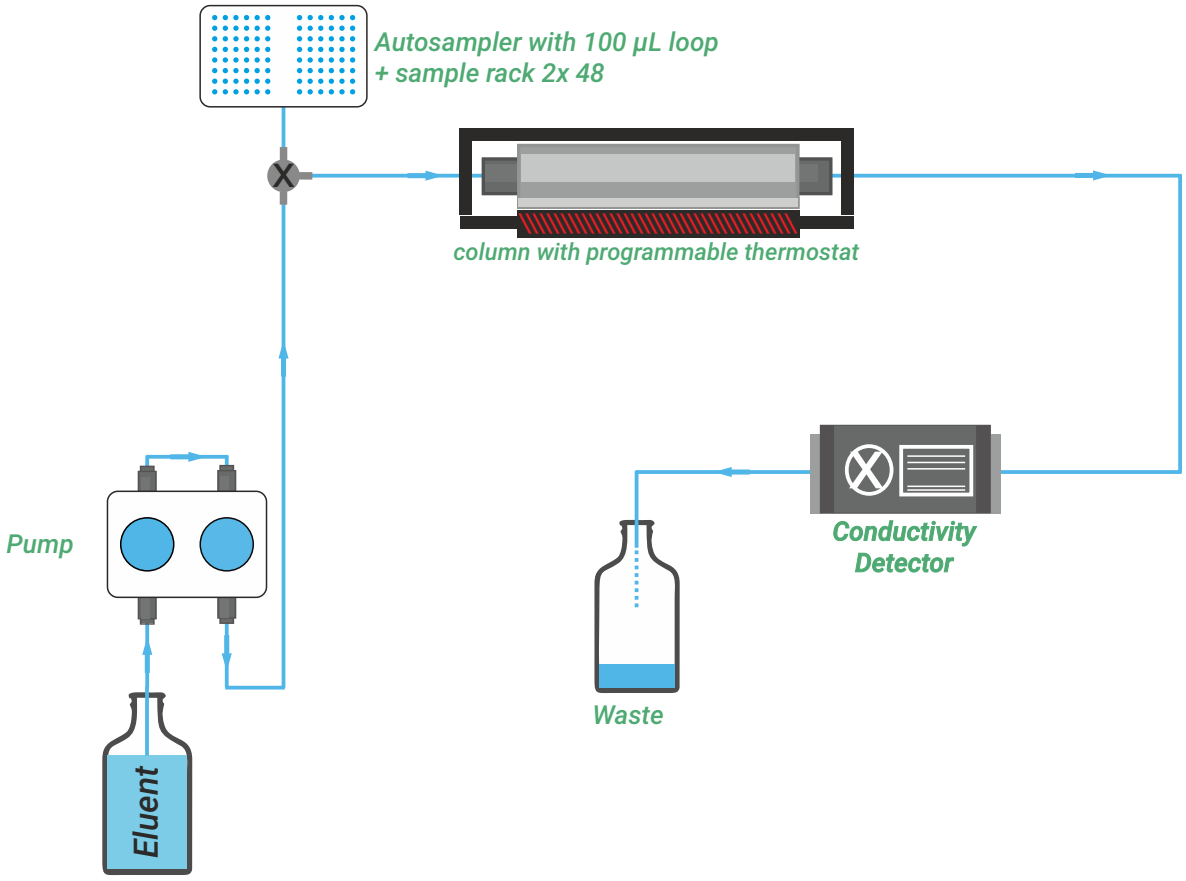
The IONUS is suitable for the analysis of anions and cations in research, development and everyday routine as well as for water within the scope of environmentally relevant investigations. The sample solutions are mostly water based and may contain water-miscible organic solvents. A classic example is the analysis of (drinking) water according to EPA 300 Part A and B.

The advantage of IONUS is the compatibility with IC columns of all manufactures and it is compatible with all common eluents of anion and cation chromatography.

In a standard configuration the IONUS comes without a suppressor, which is sufficient for most analysis and applications technique.

IONUS without suppressor



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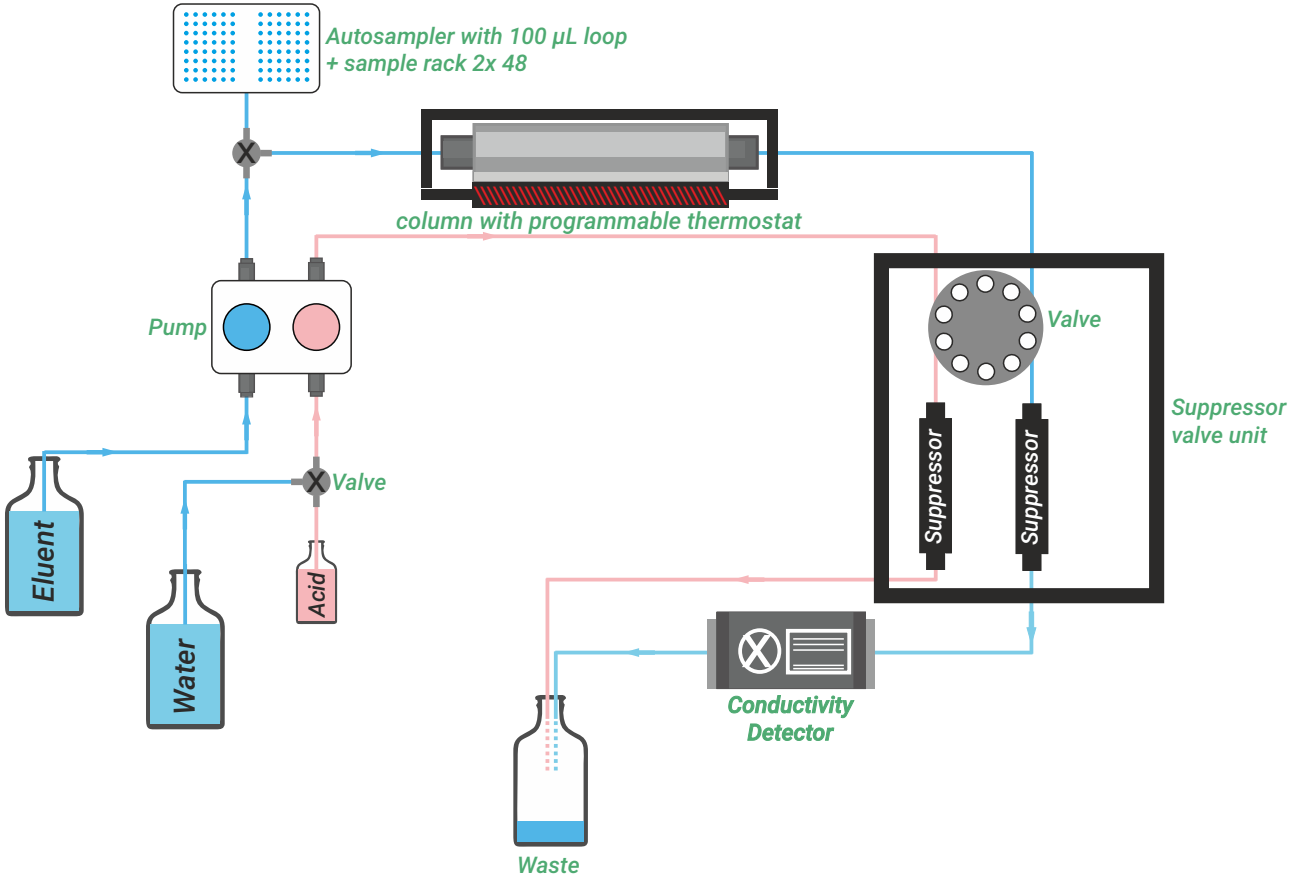
When applying without suppressor technique, it can happen that in the chromatogram the peak areas are very small due to very small conductivity.

In order to measure smaller concentration ranges in anion analysis, the instrument can be equipped with suppressor technology with chemical based regeneration to lower the conductivity of the eluent.

The IONUS also can be equipped with an UV/VIS detector. In this case the external UV/VIS detector can provide a remedy by using indirect UV detection for light-absorbing eluents. Another possibility is to use non-absorbent eluents for light-absorbing sample substances.

IONUS with suppressor



IONUS PCD

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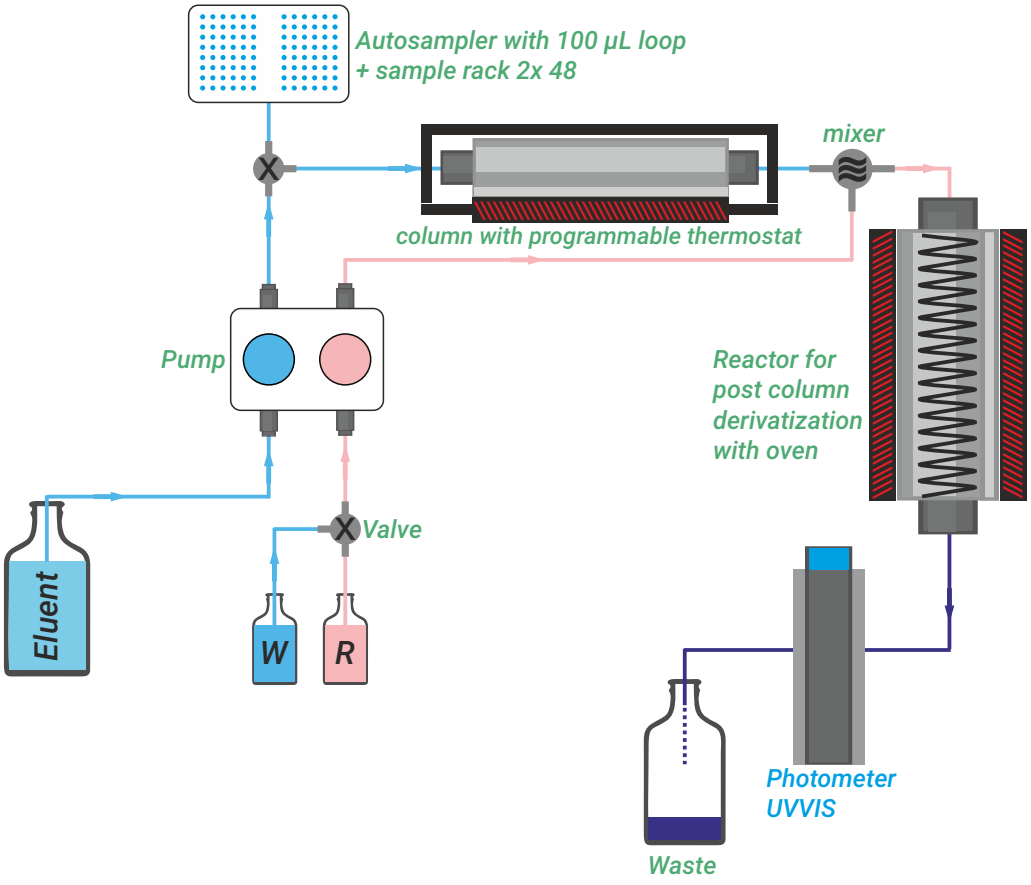
The IONUS Post Colum Derivatization (PCD) does not have a built- in conductivity detector. Instead, it has a reactor for derivatization followed by a single wavelength photometer.

These single wavelength photometers are very sensitive compared to a variable UV/VIS detector, and it can be easily changed by the user.

The choice of wavelength depends on the selected colour reaction, such as for the two bromate determination according to EPA 317 or 326 with 440 nm or 355 nm. For the determination of Chromium (III)/(VI) 340 nm or 530 nm are used.

The IONUS PCD also offers the advantage that it can be used with IC columns of al manufactures and it is compatible with all common eluents of anion and cation chromatography.

IONUS PCD


Autosampler with 100 µL loop
+ sample rack 2x 48
mixer
column with programmable thermostat
Pump
Reactor for
post column
derivatization
with oven
Eluent
Valve
W
R
Photometer
UVVIS
Waste

Technical Specifications

ION ANALYZER

method	ion exchange chromatography of anions and cations in subsequent mode
manual injection	20 µL further injection loops upon request
autosampler	standard loop 100 µL, 2 racks, each of them with space for 48 vials (1.5 mL) or 12 vials (6 mL), sample cooling Injection modes: full loop, partial loop, microliter pickup sample cooling down to 4 °C (Standard Setup 10 °C), max. 22 °C
column	stainless steel / PEEK
thermostat	ambient + 5 °C up to 50 °C

Technical Specifications

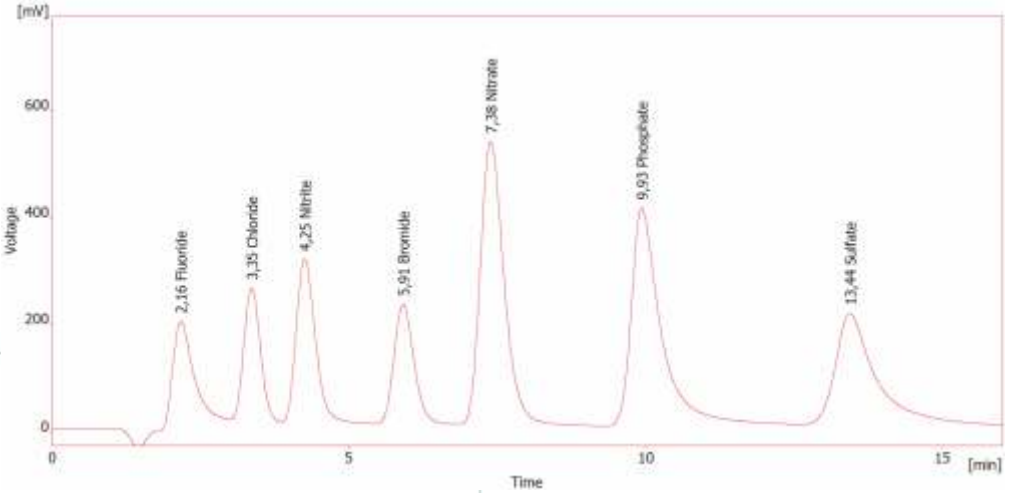
detection (IONUS)	conductivity detector: noise: 0.02 µS/ s | range: 0 - 10 mS/cm effective cell volume: 1 µL
detection (IONUS PCD)	post column derivatization (PCD) with a singe wavelength photometer in UV-VIS range (440 nm, 355 nm, 530 nm) depending on application
isocratic pump system	max. pressure: 400 bar | flow rate: 0.01 - 10.00 mL/min reproducibility of flow rate: 0.1 % RSD at 100 µL/min
maximum operating pressure	200 bar
control software & data aquisition	iControl + Clarity (21 CFR Part 11 compliant) or iControl + AminoPeak
dimensions, weight, power	800 x 350 x 375 mm*, 50 kg, 110 - 230 V

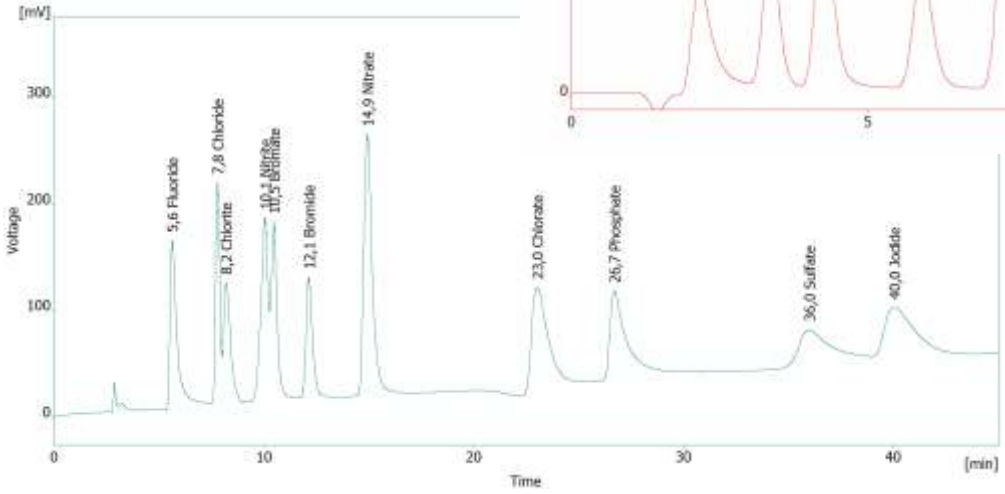
* 800 mm with opened main unit

Separation performance / anions

separation of anions

performed with the column Cat. No. 650-0105
+ 3.2 mM sodium carbonate,
+ 1.0 mM sodium hydrogen carbonate
+ 0.1 mM sodium thiocyanate as eluent
  with suppressor technique.





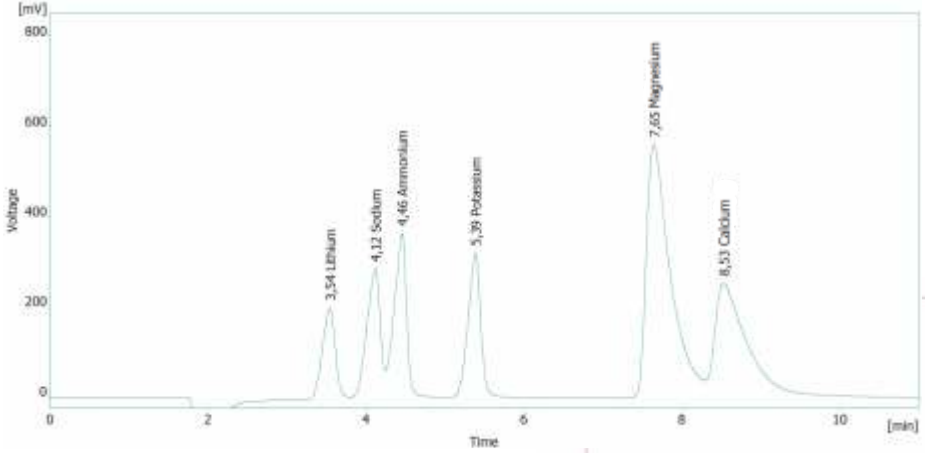
separation of anions

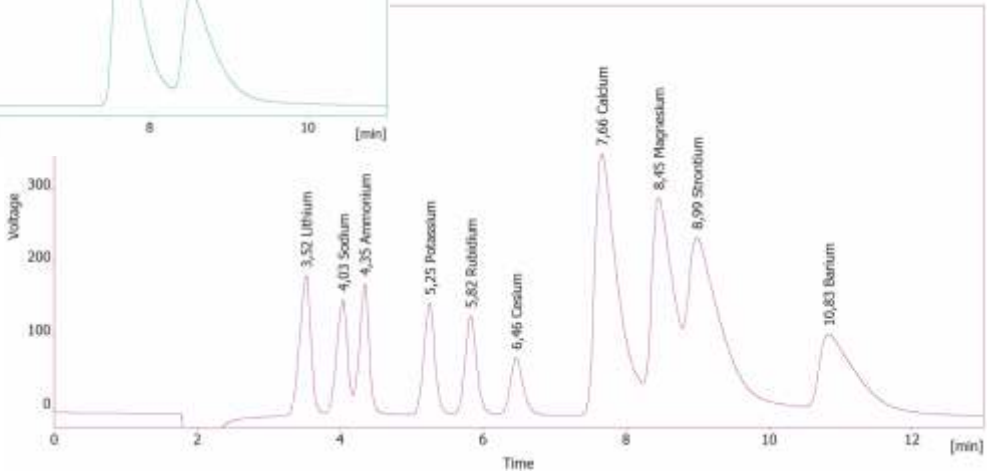
performed with the column Cat. No. 650-0195
+ 1.25 mM sodium carbonate
+ 3.5 mM sodium hydrogen carbonate
+ 0.1 mM sodium thiocyanat as eluent
  with suppressor technique.

Separation performance / cations

separation of cations

performed with the column Cat. No. 650-0109 + 5 mM nitric acid as eluent.





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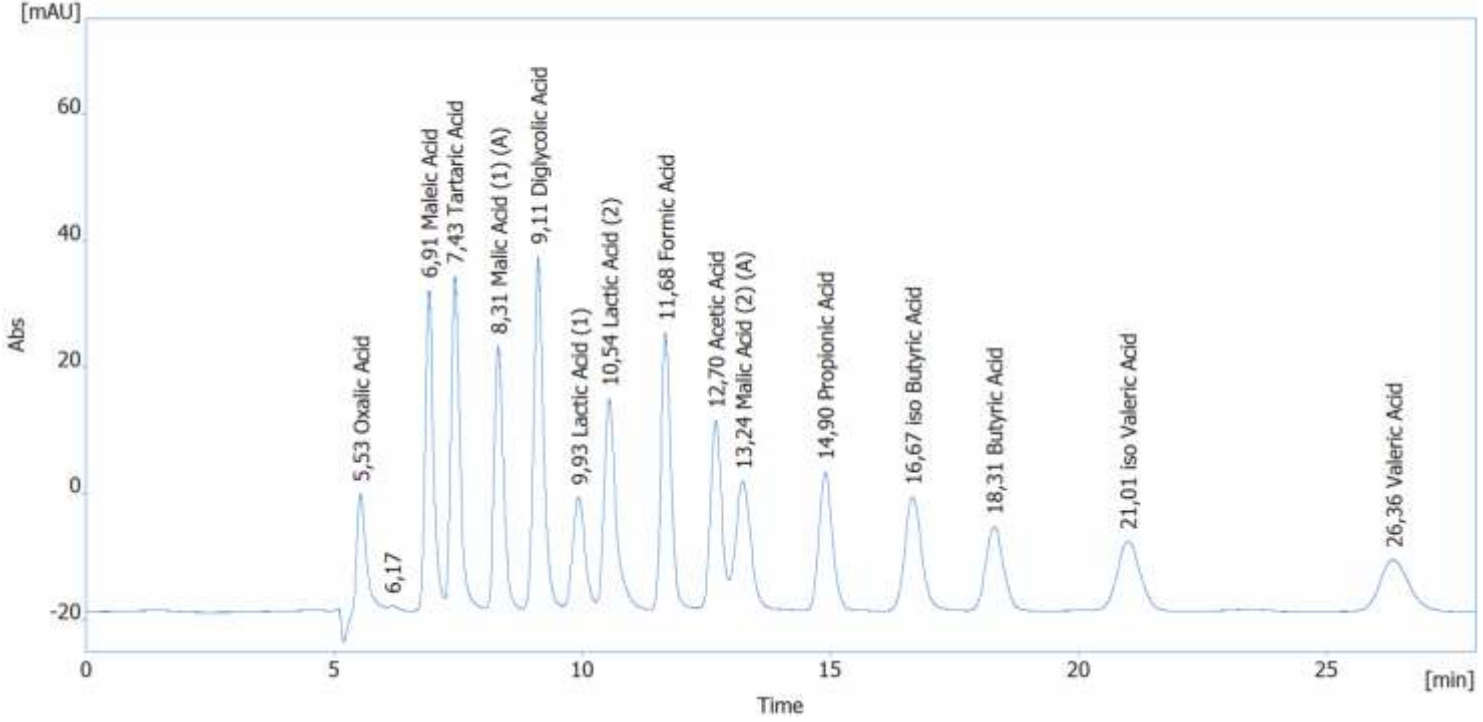
Separation performance / organic acids

separation of organic acids

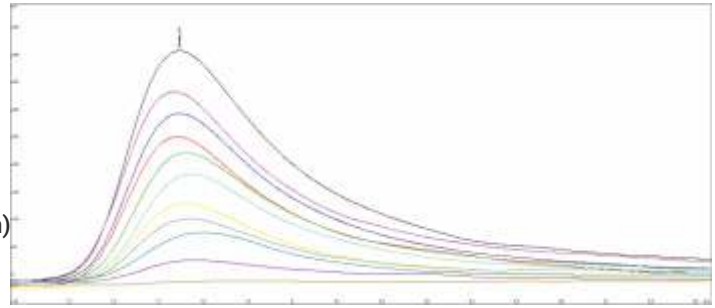
performed with the column Cat. No. 650-0180 + 10 mM sulfuric acid as eluent with indirect UV method.

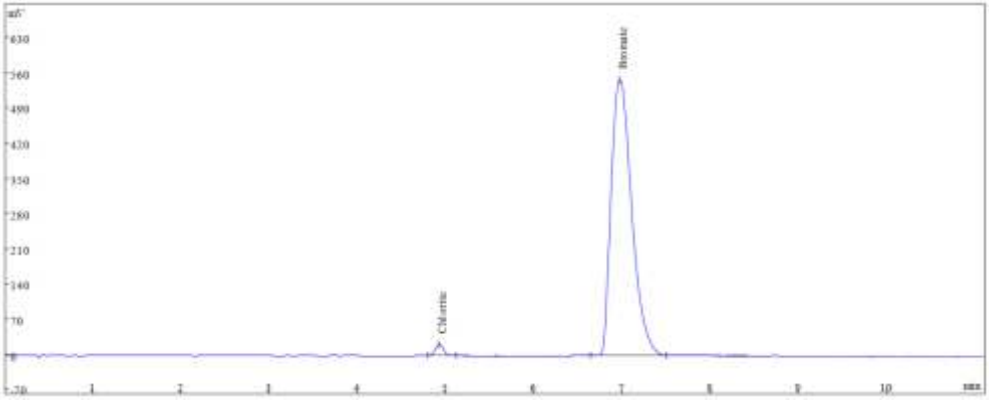


Separation performance / Post Column Derivatization

detection of bromate (100 - 1 ppb)

performed with the column Cat. No. 650-0106
+ 200 mM methane sulfonic acid as eluent
+ 0.27 M potassium iodide and
50 µM ammonia heptamolybdate as reagent
according to method EPA 326.0 (UV detection 355 nm)





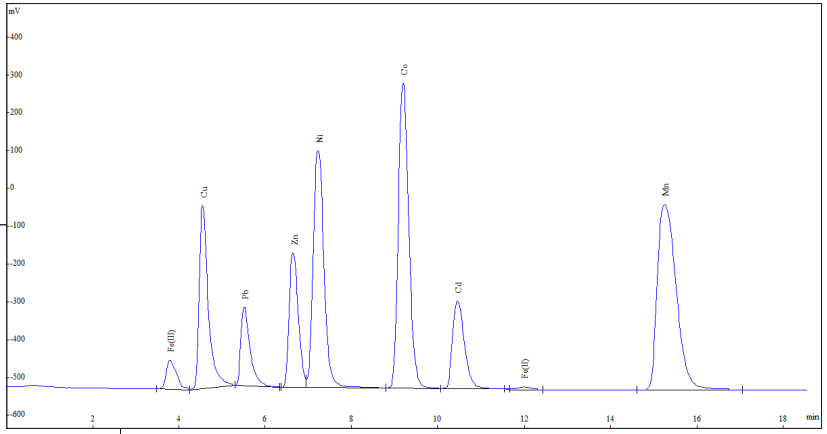
detection of bromate

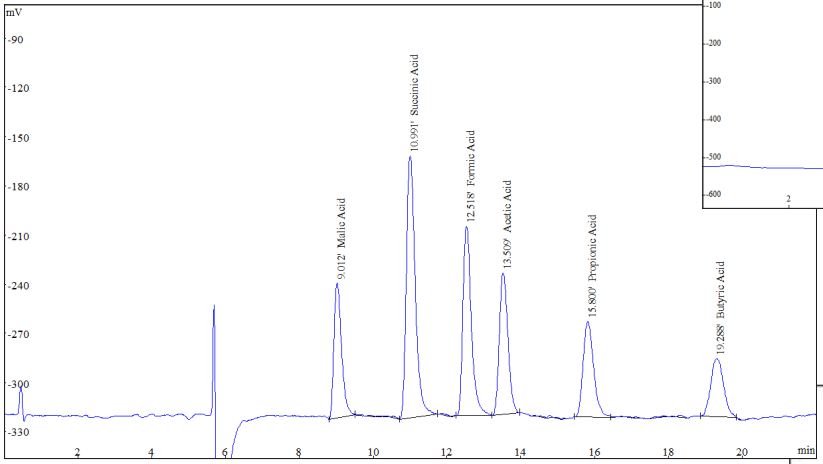
performed with the column Cat. No. 650-0106
+ 5 mM sodium carbonate
+ 2.5 mM sodium hydrogen carbonate
+ 0.1 mM sodium thiocyanate as eluent
and o-Dianisidine as reagent according to
method EPA 317.0 (UV detection 440 nm).

Separation performance / Post Column Derivatization

detection of transition metals

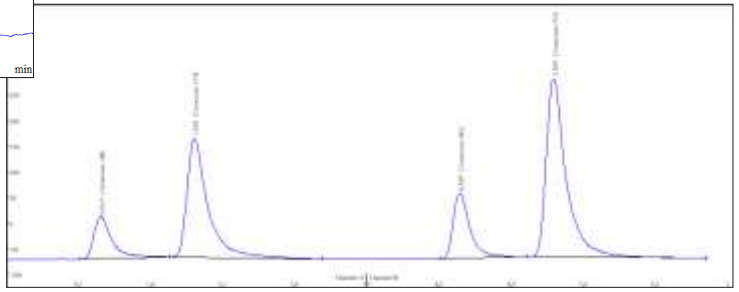
performed with the column Cat. No. 650-0099 +
100 mM tartaric acid as eluent
+ 0.2 mM pyridylazoresorzinol (PAR) in 3 M ammonia hydroxide/
1 M acetic acid as reagent (VIS detection 530 nm).





detection of organic acids

performed with the column Cat. No. 650-0180 + 10 mM sulfuric acid as eluent and with a solution of Bromothymol Blue as reagent (VIS detection 440 nm).



detection of Chromium (III)/(VI)

performed with the column Cat. No. 650-0132 + 30 mM ammonium nitrate and 1.75 mM Pydridine-2,6-dicarboxylic acid (PDCA) as eluent and with a solution of 2.0 mM 1,5 Diphenylcarbohydrazide as reagent (UV detection 340 nm, VIS detection 530 nm).

Columns

column	determination of	Suppressor	Remarks	Cat. No
PRP-X100 (Standard), SS 50 mm x 4.1 mm ID, 5 µm	Anions	yes & no	EPA 300 part A	650-0105
PRP-X110S, SS 250 mm x 4.1 mm ID, 7 µm	Anions + Oxohalides	yes	EPA 300 part B	650-0195
PRP-X100, PEEK 100 mm x 4.6 mm ID, 5 µm	Bromate	no	EPA 317.0	650-0105
PRP-X100, PEEK 150 mm x 2.1 mm ID, 5 µm	Bromate	no	EPA 326.0	650-0132
PRP-X800, PEEK 250 mm x 4.6 mm ID, 7 µm	Cations	no	-	650-0109
Nucleosil 100-5SA, SS 150 mm x 4.6 mm ID, 5 µm	Transition metals	no	PCD with VIS	650-0099
PRP-X100, PEEK 100 mm x 2.1 mm ID, 5 µm	Chromium (III)/(VI)	no	PCD with VIS	650-0132
Eurokat H, SS 300 mm x 8 mm ID	Organic acids	no	indirect UV	650-0180

Options

manual injection port

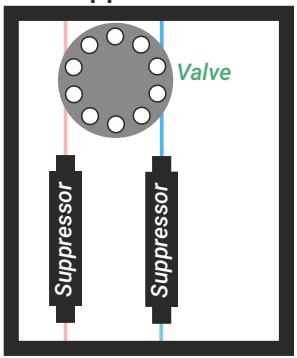
easy manual injection with manual valve with a standard volume of 20 µL (other loops up on request).

indirect UV detection

the IONUS can be equipped with an external UV/VIS detector.

anion suppressor technique

based on chemical process regeneration of suppressors with acid.



Prime and Purge Valves

High Pressure side prime and purge valves in eluent and reagent flow

For further information please refer to our Product Guideline

Consumables

Description	Cat. No.
Stocks Solution Standard 7 anions	650-0122
Stock Solution Standard 6 cations	650-0123
1.5 mL screw vials (100 pcs)	860-1794
screw caps for sample vials (100 pcs)	860-1795
snap ring vials (100 pcs)	860-0295
caps for snap ring vials (100 pcs)	860-0296
suppressor column	650-0074

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