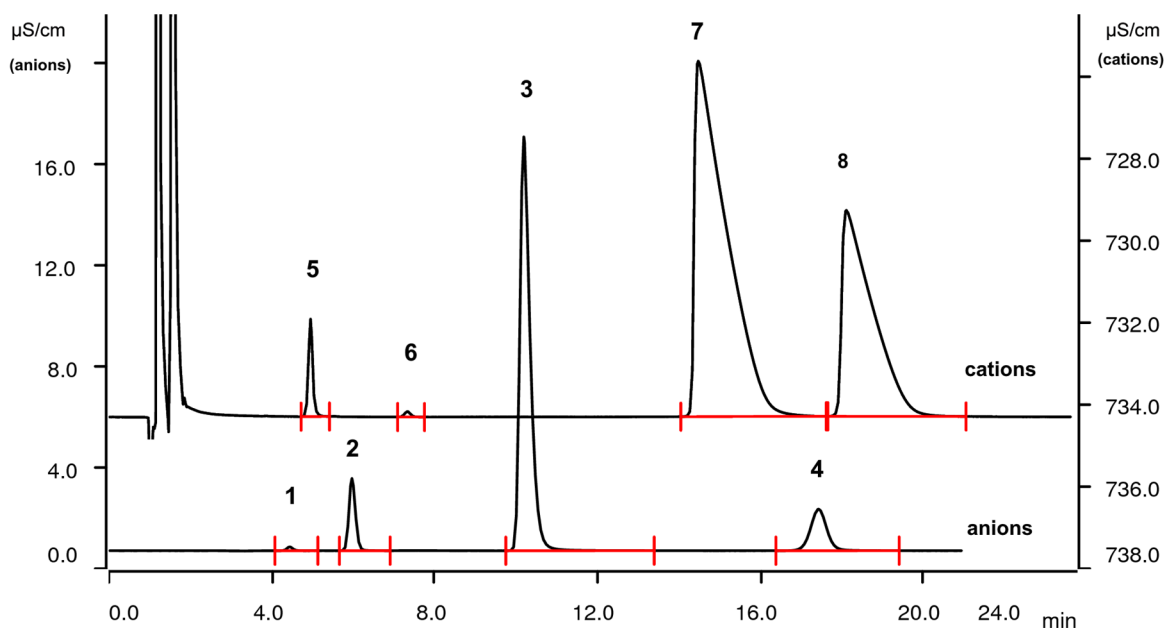


# Comprehensive water analysis with TitrIC flex II

## Determination of pH, temperature, conductivity, m- and p-value, anions, and cations



Chromatogram of several anions and cations present in well water.

The TitrIC flex II system is the perfect combination of titration, direct measurement, and ion chromatography for fully automated analysis of all key parameters. These include pH, conductivity, hardness, anions, cations, as well as the calculation of the ion balance: comprehensive water analysis from one system.

### Results

Ion chromatography			Titration / Calculation	
1	Fluoride	0.080 mg/L	Conductivity	537.8 µS/cm
2	Chloride	1.918 mg/L	Temperature	25.4 °C
3	Nitrate	27.719 mg/L	pH value	7.68
4	Sulfate	4.216 mg/L	m-value	5.317 mmol/L
5	Sodium	2.498 mg/L	p-value	0.0 mmol/L
6	Potassium	0.413 mg/L	Total hardness	2.924 mmol/L
7	Calcium	80.773 mg/L	Sum anions	0.59 mEq/L
8	Magnesium	22.091 mg/L	Sum cations	5.97 mEq/L
	Ion difference	0.07 mEq/L	Ion balance	0.55 %

## Sample

Well water

## Sample preparation

No sample preparation is required.

## Columns

Metrosep A Supp 17 - 150/4.0	6.01032.420
Metrosep A Supp 17 Guard/4.0	6.01032.500
Metrosep C 4 - 150/4.0	6.1050.420
Metrosep C 4 Guard/4.0	6.1050.500

## Electrodes

dAquatrode with Pt1000	6.00202.300
5-ring conductivity measuring cell c = 0.7 cm <sup>-1</sup> with Pt1000 (fixed cable)	6.0915.100

## Solutions

Eluent Cations	1.7 mmol/L nitric acid 0.7 mmol/L dipicolinic acid
Eluent Anions	5.0 mmol/L sodium carbonate 0.2 mmol/L sodium hydrogen carbonate
Regenerant (Dosino)	500 mmol/L sulfuric acid
Suppressor rinsing	STREAM
Titrant	0.1 mol/L hydrochloric acid

## Instrumentation IC

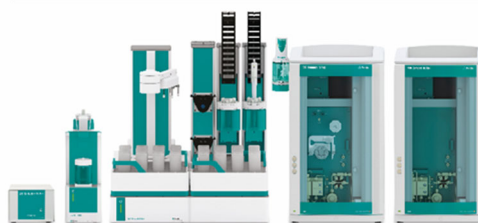
930 Compact IC Flex Oven/SeS/PP/Deg	2.930.2560
930 Compact IC Flex Oven/Deg	2.930.2160
2x IC Conductivity Detector	2.850.9010
IC equipment: Inline ultrafiltration	6.5330.110
800 Dosino for DR	2.800.0010
IC equipment: Dosino regeneration	6.5330.190

## Instrumentation Titration

OMNIS Advanced Titrator without stirrer	2.1001.0210
856 Conductivity Module	2.856.0010

## Instrumentation Sample Robot

Main module Pick&Place S	2.1010.0010
2x Pick&Place module	2.1014.0010
Peristaltic (4-channel) pump module	2.1016.0110
Rod Stirrer "Sample Robot"	2.1006.0010



## Parameters

IC, anion:	
Flow rate	0.6 mL/min
Injection volume	20 µL
P <sub>max</sub>	18 MPa
Column temperature	30 °C
Recording time	25 min

IC, cation:	
Flow rate	0.9 mL/min
Injection volume	10 µL
P <sub>max</sub>	25 MPa
Column temperature	30 °C
Recording time	26 min

## Analysis

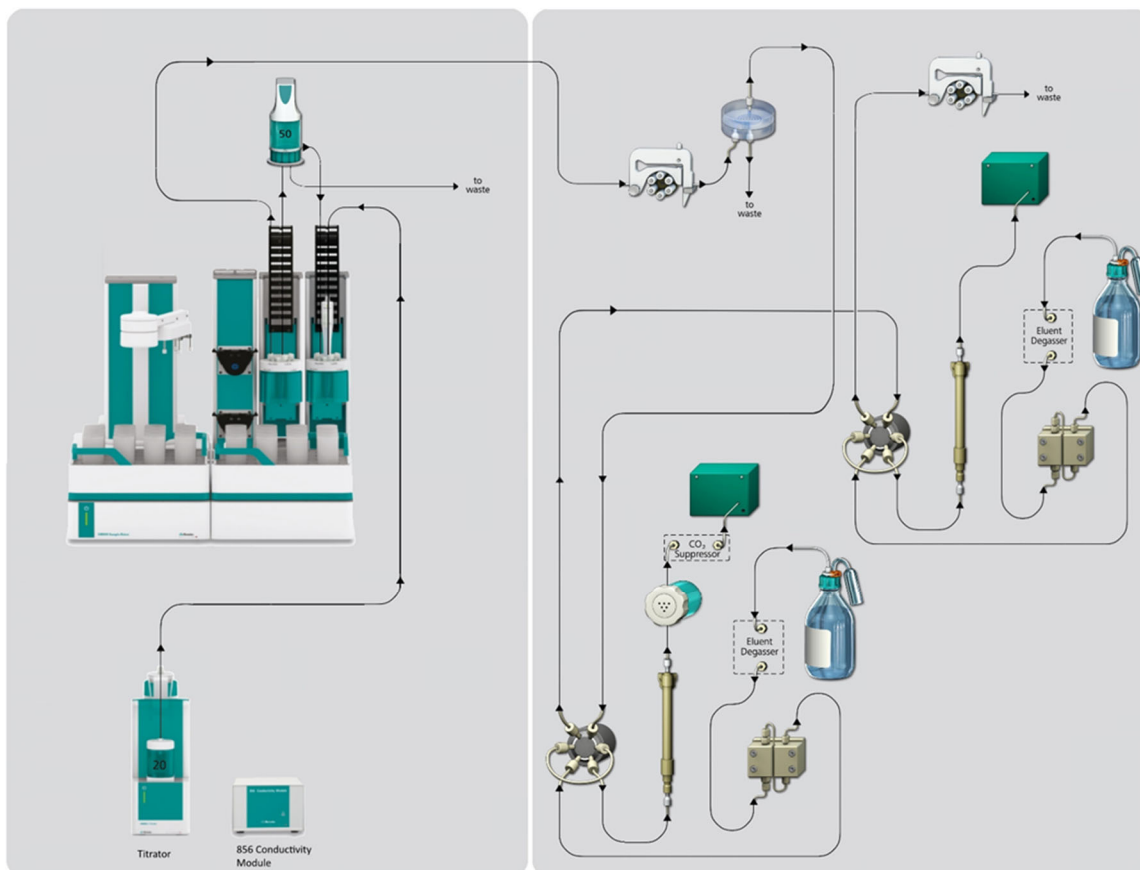
Suppressed conductivity (IC, anions)
Non-suppressed conductivity (IC, cations)
pH value, conductivity, temperature (direct measurement)
m-value, p-value (potentiometric titration)

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 **Metrohm**

# Method description

## Flow chart



The IC peristaltic pump fills the injection loops of both ion chromatographs with sample after passing it through the Inline Ultrafiltration cell. The temperature and conductivity determinations occur at the first Pick&Place location of the Sample Robot. For the pH measurement and the acid capacity (p- and m- values) determination, an exact sample volume is transferred by a Dosino to the second Pick&Place. MagIC Net handles all final calculations and reporting.