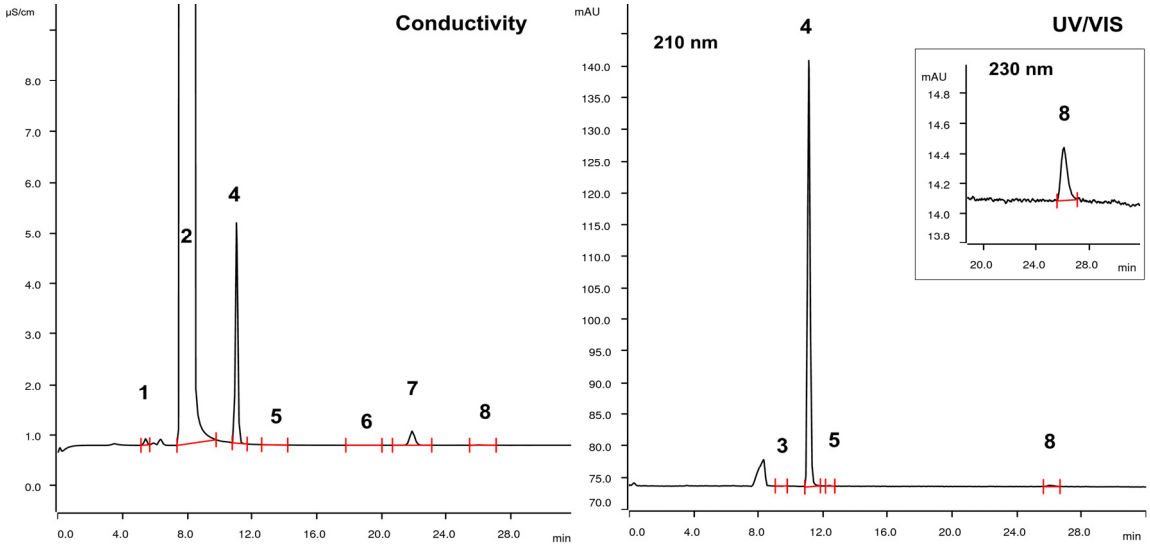
IC Application Note S–378

Anions in refining process water applying tandem conductivity and UV detection

Determination of anions according to ASTM D8234 on a Metrosep A Supp 5 - 250/4.0 column



Sample chromatograms (left – conductivity, right – UV/VIS at 210 nm, insert right – iodide peak at 230 nm.

ASTM D8234 describes the determination of anions in high saline water by applying suppressed conductivity followed by UV/VIS detection. This combination enables the determination of e.g. nitrite by UV detection. With conductivity detection, this quantification is not possible or difficult due to the very large chloride peak. The actual sample is a refining process liquid with a high chloride content. As the sample solution also contains organic material, Inline Dialysis is applied to protect the analytical column. The combination of the two detection modes and the Inline Dialysis option reduces manual sample preparation and substantially increases the accuracy of the analysis.

Results UV/VIS

	Anion	Result [mg/L]
1	Nitrate	< 2.5
2	Bromide	790
3	Nitrate	< 2.5
4	Iodide	9.6

For complete results, see next page.

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Sample

Petrochemical process liquid containing approximately 10% chloride.

Sample preparation

Dilution 1:100 with ultrapure water and subsequent Inline Dialysis.

Columns

Metrosep A Supp 5 - 250/4.0	6.1031.530
Metrosep A Supp 5 Guard/4.0	6.1031.500

IC Solutions

Eluent	3.2 mmol/L sodium carbonate 1.0 mmol/L sodium hydrogen carbonate
Regenerant Dosino	500 mmol/L sulfuric acid
Rinsing	STREAM
Acceptor solution	Ultrapure water

Instrumentation

930 Compact IC Flex Oven/SeS/PP/Deg	2.930.2560
IC Conductivity Detector	2.850.9010
944 UV/VIS Detector Vario	2.944.0010
858 Professional Sample Processor	2.858.0030
800 Dosino for Dosino Regeneration	2.800.0010
MSM Rotor A	6.2832.000
Adapter sleeve for Suppressor Vario	6.2842.020
IC equipment: Dosino Regeneration	6.5330.190
IC equipment: Inline Dialysis	6.5330.100

Analysis

Conductivity detection after sequential suppression and UV/VIS detection in series

Parameters IC

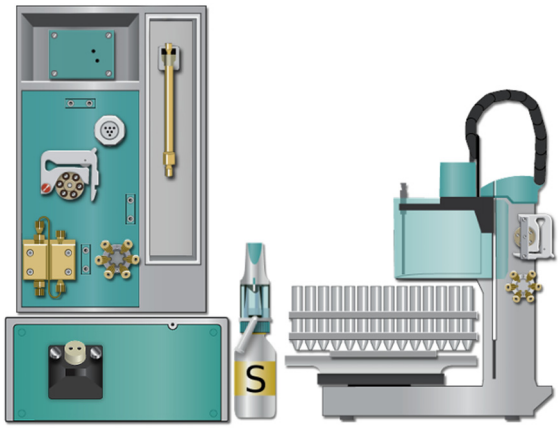
Flow rate	0.7 mL/min
Injection volume (MiPT)	20 µL
P_{max}	15 MPa
Column temperature	40 °C
Recording time	32 min

Parameters UV/VIS

Wavelength	210 nm (NO_2^-, Br^-, NO_3^-)
Wavelength	230 nm (I^-)
Measuring time	300 ms

Full results

	Anion	Conductivity	UV/VIS
1	Fluoride	10.0	-
2	Chloride	101000	-
3	Nitrite	< 2.5	< 2.5
4	Bromide	763	790
5	Nitrate	< 2.5	< 2.5
6	Phosphate	< 10	-
7	Sulfate	86.9	-
8	Iodide	9.3	9.6



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Version 1, published in February 2020