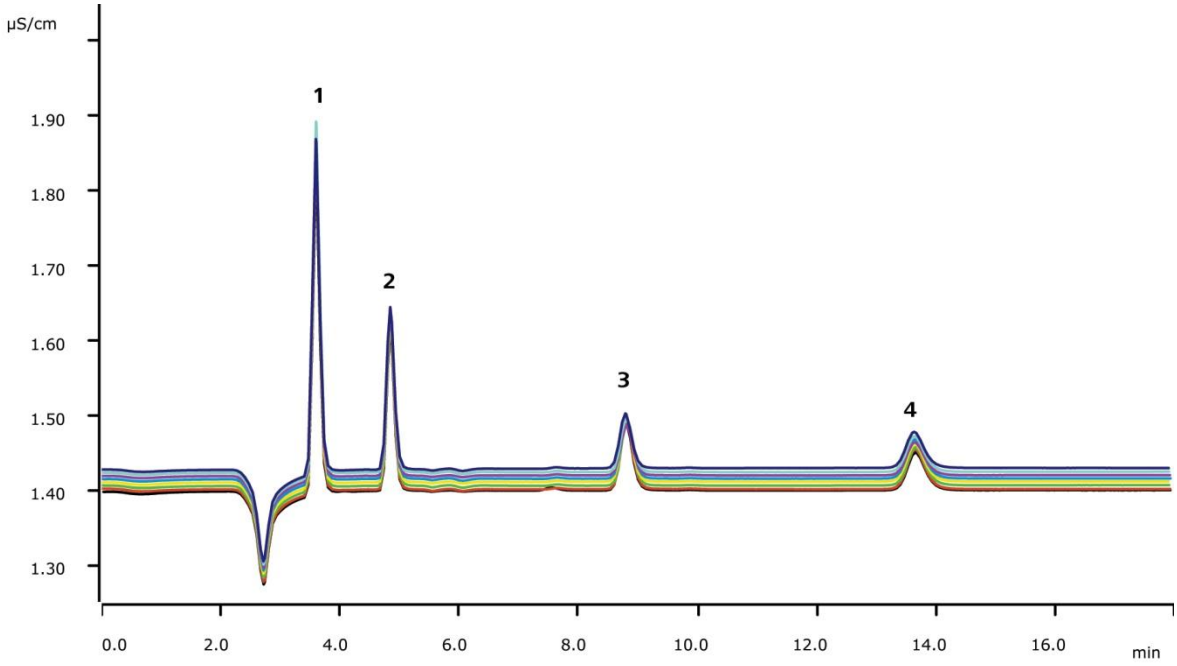
IC Application Note Q–5

Online analysis of trace anions in power plant water matrices



A setup that allows online sampling is crucial for immediate and contamination-free analysis of power plant water samples. This application recommends a setup that facilitates simultaneous anion/cation determinations. Automated inline sample preparation combines variable preconcentration (MiPCT) and calibration with a single multi-ion standard. AN-Q-004 displays the respective cation results.

Results

Check standard	Concentration [µg/L] (72 h)	RSD [%] (72 h)
1 Fluoride	1.99	4.07
2 Chloride	1.99	1.20
3 Sulfate	2.04	8.67
4 Chromate	1.98	5.23

Metrohm

Sample

Artifical boiler water check standard

Sample preparation

Inline Preconcentration (MiPCT)

Columns

Metrosep A Supp 5 - 150/4.0	6.1006.520
Metrosep A Supp 4/5 Guard/4.0	6.1006.500
Metrosep A PCC 1 HC/4.0	6.1006.310

Solutions

Eluent (inline eluent preparation)	6.4 mmol/L sodium carbonate 2.0 mmol/L sodium hydrogen carbonate
Suppressor regenerant	100 mmol/L sulfuric acid
Rinsing / liquid handling solutions	Ultrapure water

Analysis

Conductivity after sequential suppression

Parameters

Flow rate	0.7 mL/min
Injection volume	2000 µL
P_{max}	15 MPa
Recording time	18 min
Column temperature	32 °C

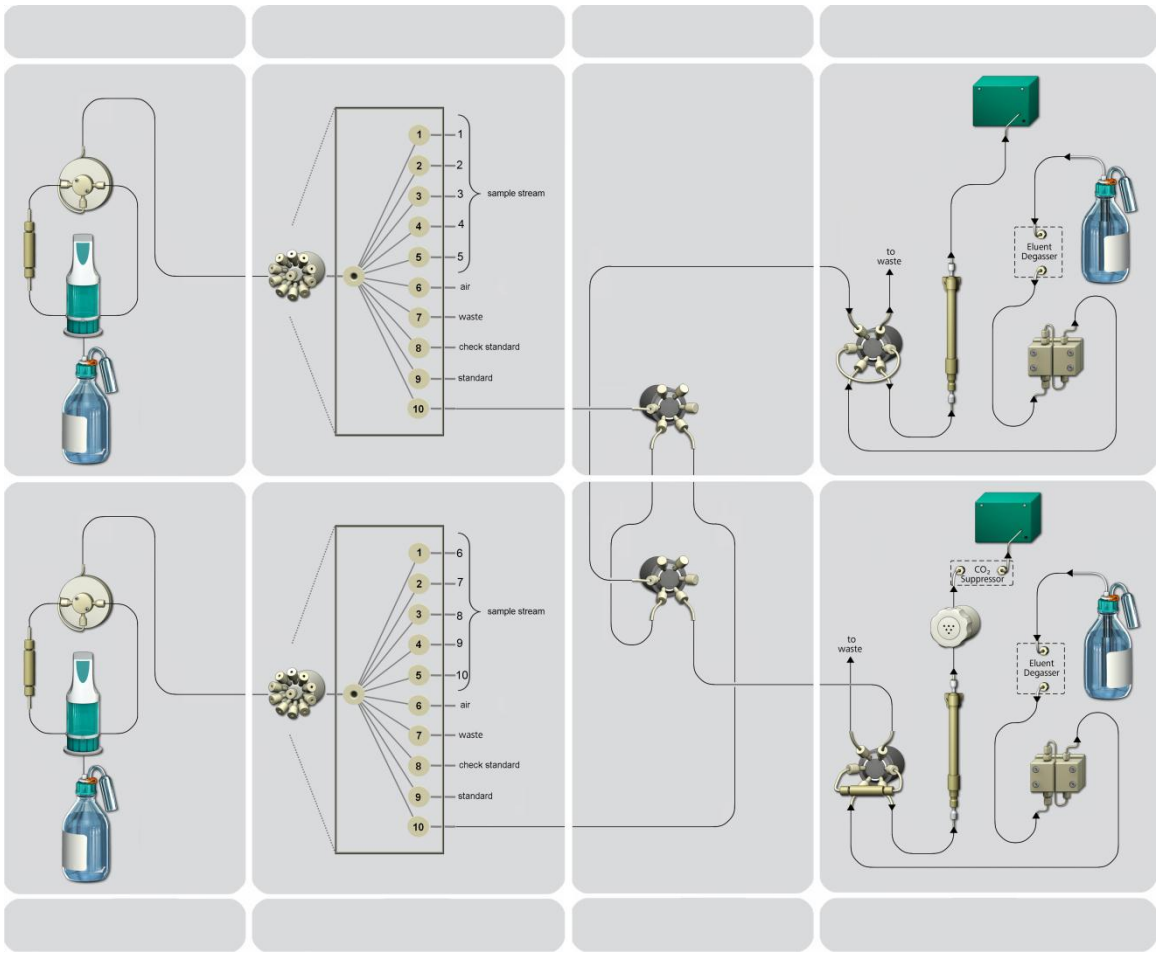
Instrumentation (for AnCat analysis)

850 Professional IC AnCat – MCS	2.850.3030
2 x IC Conductivity Detector	2.850.9010
2 x 872 Extension Module Liquid Handling	2.872.0060
2 x 800 Dosino (liquid handling)	2.800.0010
849 Level Control for Inline Eluent Preparation	2.849.1030

Calibration MiPCT

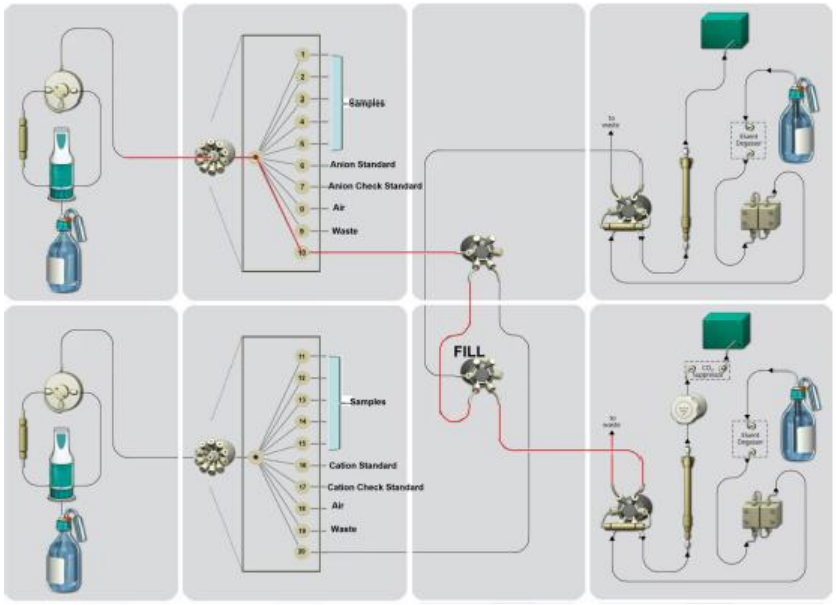
Calibration range	Factor of 40
Standard solution	20 µg/L
1. Level	0.5 µg/L = 50 µL
2. Level	1.0 µg/L = 100 µL
3. Level	2.0 µg/L = 200 µL
4. Level	5.0 µg/L = 500 µL
5. Level	10.0 µg/L = 1000 µL
6. Level	15.0 µg/L = 1500 µL
7. Level	20.0 µg/L = 2000 µL

Flow chart

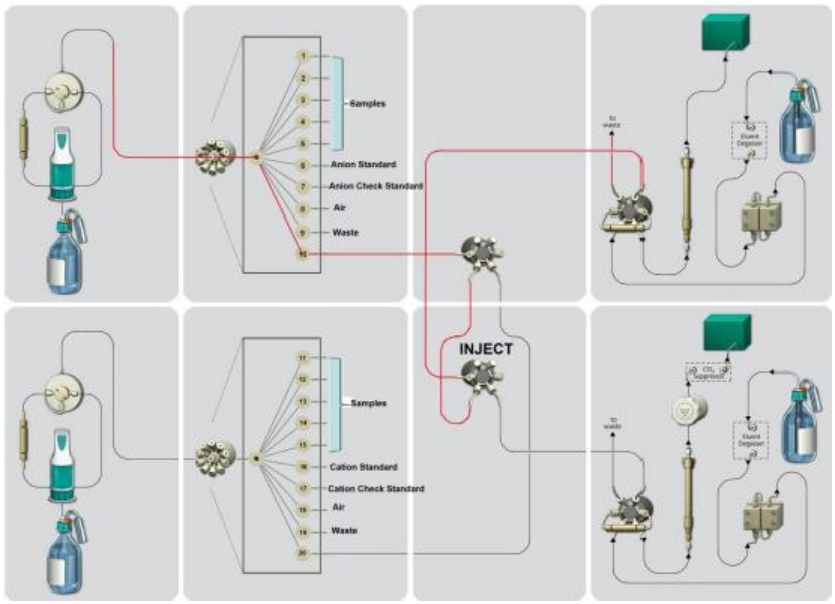


Sample Transfer Dosino 1

Sample lines 1…5 to anion analysis

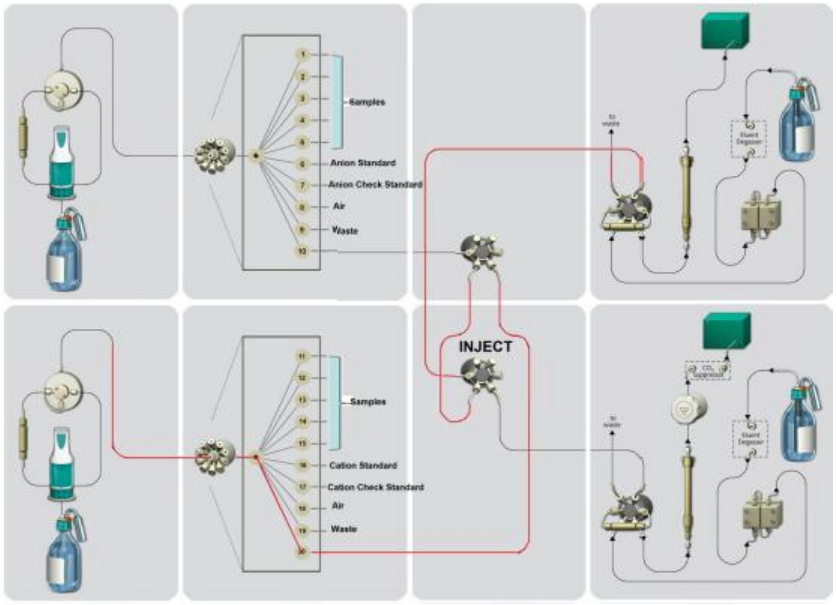


Sample lines 1…5 to cation analysis



Sample Transfer Dosino 2

Sample lines 11…15 to cation analysis



Sample lines 11…15 to anion analysis