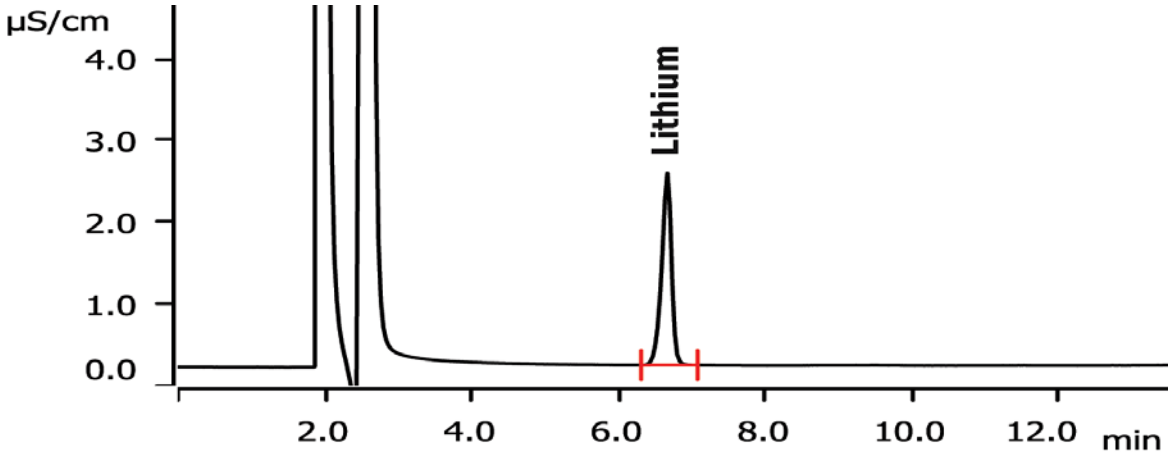
IC Application Note C–167

Quality test of an automatic and direct 1:2000 dilution applying Inline Dilution Technique



Automatic dilution reduces manual work and improves the reproducibility and accuracy of the results. So far, the Inline Dilution Technique (MIDT) has been tested in a range of max. 1:100. Using a dedicated sample needle this range is enlarged significantly. This Application Note shows the performance of an Inline Dilution with a factor of 1:2000 as well as a comparison of manual and inline dilution for a dilution factor of 1:1000.

Results

Dilution 1:2000	Conc. [mg/L]	RSD [%, n = 5]	Recovery [%]
Lithium	1	2.5	95

Manual vs. inline (dilution 1:1000)	Ammonium	Potassium	Calcium
Area (manual) [µS/cm*min]	0.182	5.03	4.86
Area (inline) [µS/cm*min]	0.177	5.10	4.92
RSD (manual) [%]	0.34	1.47	1.80
RSD (inline) [%]	2.4	1.3	4.0
Recovery [%]	97	100	95

Metrohm

Sample

1000 mg/L standard solution

Sample preparation

Metrohm Inline Dilution 1:2000

Columns

Metrosep C 4 - 250/4.0	6.1050.430
Metrosep C 4 Guard/4.0	6.1050.500

Solutions

Eluent	1.7 mmol/L nitric acid 0.7 mmol/L dipicolinic acid
Liquid handling	Ultrapure water

Analysis

Direct conductivity detection

Instrumentation

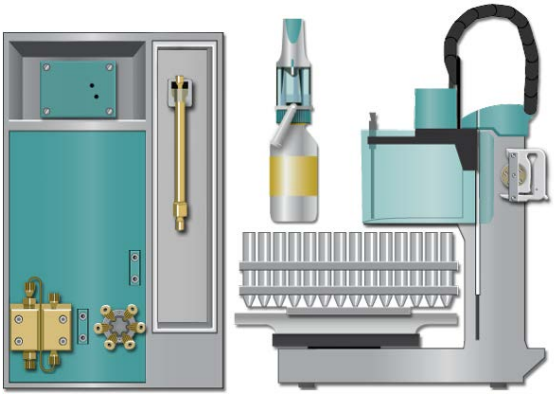
930 Compact IC Flex Oven/Deg	2.930.2160
IC Conductivity Detector	2.850.9010
858 Professiona Sample Processor	2.858.0020
800 Dosino	2.800.0010
741 Magnetic Stirrer	2.741.0010
IC equipment: Inline Dilution	6.5330.120
Coated sample needle made of steel	6.2624.200
Needle/tube holder 1/16 in.	6.2833.010

Parameters

Flow rate	0.9 mL/min
Injection volume	20 µL
P_{max}	25 MPa
Recording time	38 min
Column temperature	30 °C

Calibration MIDT

Calibration range	Factor of 1000	
Standard solution:	50	mg/L
Number of standard	= Dilution factor	
Standard 1	50	mg/L
Standard 2	25	mg/L
Standard 5	10	mg/L
Standard 10	5.0	mg/L
Standard 20	2.5	mg/L
Standard 50	1.0	mg/L
Standard 100	0.5	mg/L
Standard 200	0.25	mg/L
Standard 500	0.10	mg/L
Standard 1000	0.05	mg/L



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