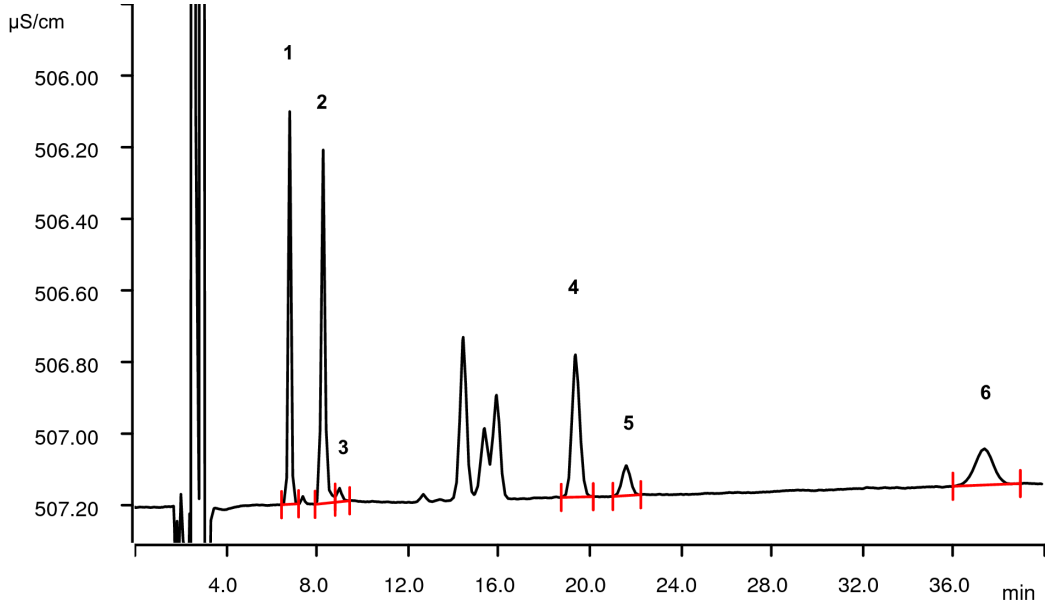
IC Application Note C–190

Analysis of amine emulsifiers besides standard cations

Determination of isopropylamine and dicyclohexylamine in emulsions on a Metrosep C 4 - 250/4.0 applying direct conductivity detection after Inline Dialysis.



Cation chromatogram of an emulsion sample after Inline Dialysis showing isopropylamine (2) and dicyclohexylamine (6) beside major cations. Unintegrated peaks indicate Unidentified components.

Isopropylamine and dicyclohexylamine are used as emulsifiers and need to be determined in emulsions along with standard cations. However, emulsions must not be injected directly into the ion chromatograph as the organic components may damage the ion exchanger stationary phase in the separation column. Inline Dialysis as sample preparation is the perfect tool for such samples. The ions of interest are separated from the organic phase by diffusion through the hydrophilic membrane, thus protecting the column. Full automation makes the analyses even easier and more efficient for the user.

Results

	Cation	Concentration [mg/L]		Cation	Concentration [mg/L]
1	Sodium	161.2	4	Calcium	205.7
2	Isopropylamine	794.0	5	Magnesium	22.2
3	Potassium	< 10	6	Dicyclohexylamine	872.4

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Sample

Emulsion solutions

Sample preparation

Samples were diluted 1:200 in diluent.

Cation 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 0.4 mmol/L dipicolinic acid 15% acetone
Acceptor solution / diluent	2 mmol/L nitric acid 10% acetone

Instrumentation

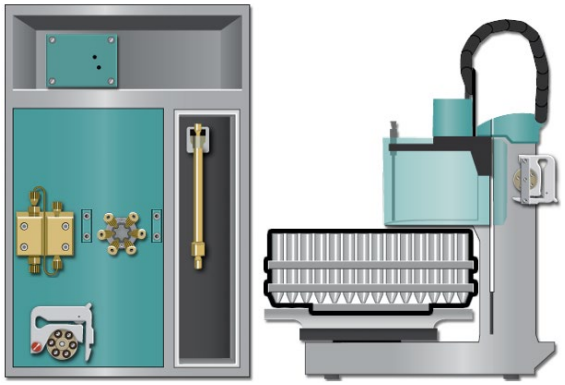
940 Professional IC Vario ONE/Prep 1	2.930.1110
IC Conductivity Detector	2.850.9010
858 Professional Sample Processor	2.858.0020
IC equipment: Inline Dialysis	6.5330.100
Dialysis membrane (polyamide)	6.2714.030

Analysis

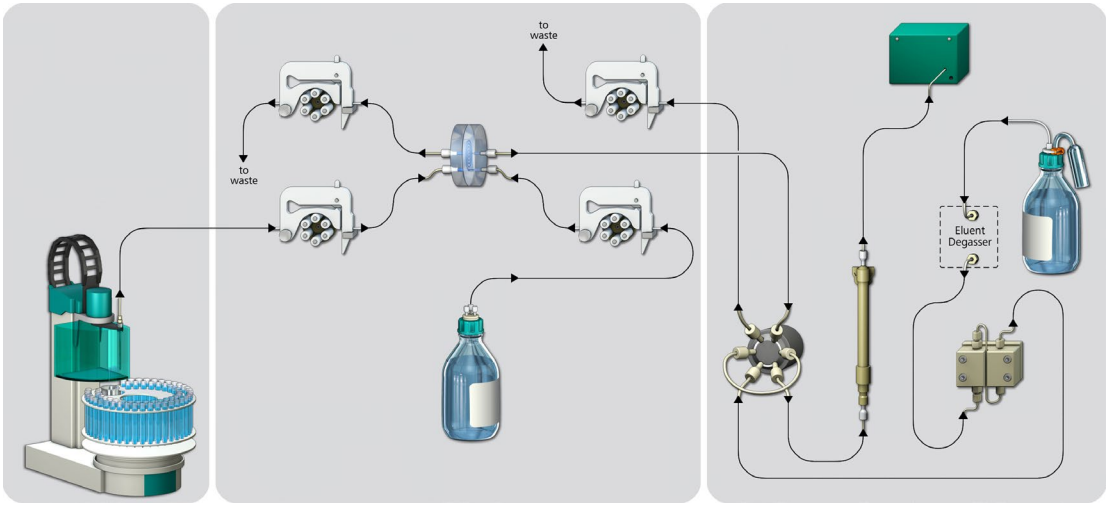
Direct conductivity detection

Parameters

Flow rate	0.9 mL/min
Injection volume	20 µL
P_{max} (cations)	20 MPa
Column temperature	45 °C
Recording time	40 min



System setup



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