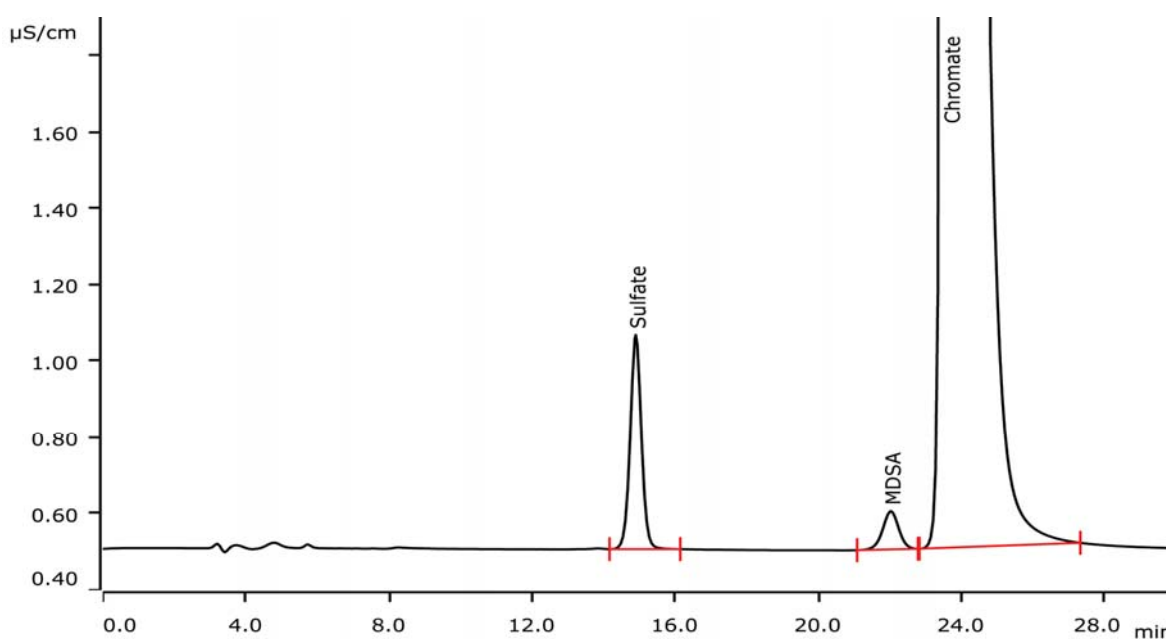


Methanedisulfonic acid in a chromium plating bath applying nested Inline Dilution, Dosino Regeneration, and STREAM



Methanedisulfonic acid (MDSA) is used as catalyst in chromium plating baths. Its determination is required to keep the chromating quality of the bath. The sample requires a 2500-fold dilution. This Application Note shows the automatic Inline Dilution that proceeds in two steps. While one sample is analyzed, the time-optimized method already dilutes the next sample. The MSM is regenerated using a 800 Dosino and the STREAM setup: after leaving the detector, the eluent is used for rinsing the regenerated MSM compartment.

Results

	Mean concentration [%]	RSD [%]
Sulfate	n.q.	
MDSA	4.29	2.1
Chromate	n.q.	

Sample

Chromium plating bath

Sample preparation

Metrohm Inline Dilution, 1 : 2500 in two steps (1 : 50 each) and subsequent Metrohm Inline Ultrafiltration

Columns

Metrosep A Supp 5 - 150/4.0	6.1006.520
Metrosep A Supp 4/5 Guard/4.0	6.1006.500

Solutions

Eluent	3.2 mmol/L sodium carbonate 1.0 mmol/L sodium hydrogen carbonate 30% acetone
Suppressor regenerant	500 mmol/L sulfuric acid
Rinsing solution	STREAM

Parameters

Flow rate	0.7 mL/min
Injection volume	10 µL
P _{max}	15 MPa
Recording time	30 min
Column temperature	ambient

Analysis

Conductivity after sequential suppression

Instrumentation

940 Professional IC Vario ONE/SeS/PP	2.940.1500
IC Conductivity Detector	2.850.9010
858 Professional Sample Processor – Pump	2.858.0020
2 × 800 Dosino	2.800.0010
Magnetic Stirrer	2.741.0010
IC equipment: Inline Ultrafiltration	6.5330.110
IC equipment: Inline Dilution	6.5330.120
IC equipment: Dosino Regeneration	6.5330.190
MSM Rotor A	6.2832.000
Adapter sleeve for Suppressor Vario	6.2842.020

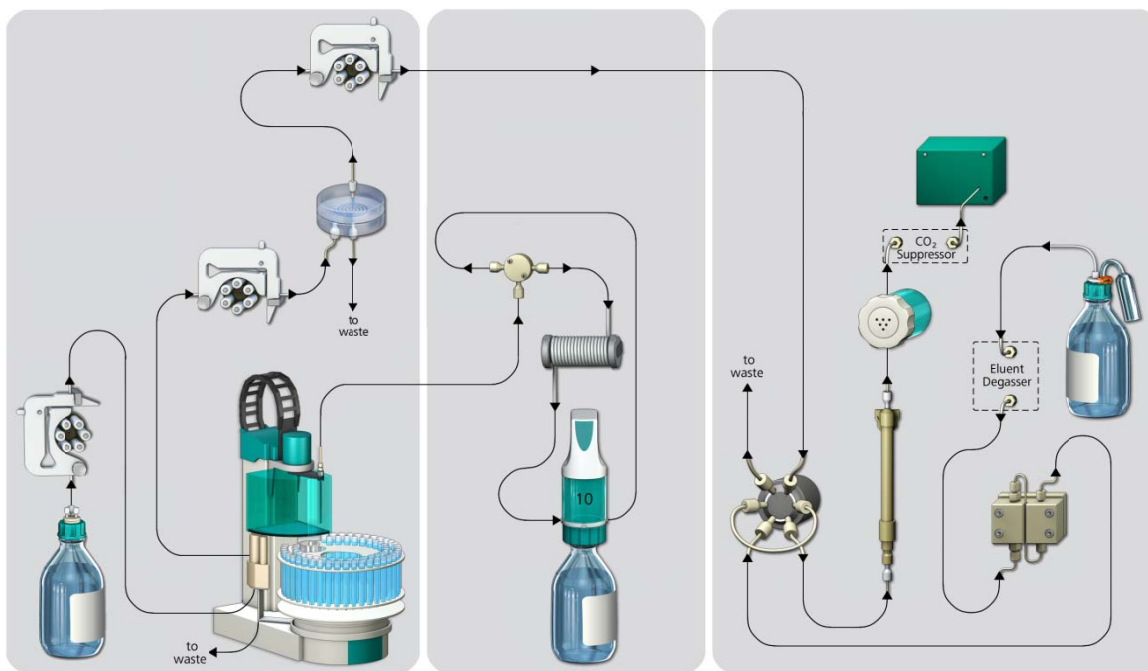


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Flow chart Inline Dilution combined with Inline Ultrafiltration

Function: The 800 Dosino aspirates the required sample volume to the buffer tubing, which is then dispensed into the Liquid Handling Station. After diluting with the respective volume of ultrapure water and mixing, the required volume for the second dilution step is again aspirated to the buffer tubing. Now, the sample needle and the Liquid Handling Station are rinsed with ultrapure water (800 Dosino using port on the right side). Subsequently, the second dilution is performed before the final sample solution is injected via the inline ultrafiltration setup.



Flow chart STREAM with Dosino Regeneration

Function: the effluent of the conductivity detector is fed back to the rinsing compartment of the MSM. The regeneration solution may be delivered either by a peristaltic pump or by an 800 Dosino (this application).

