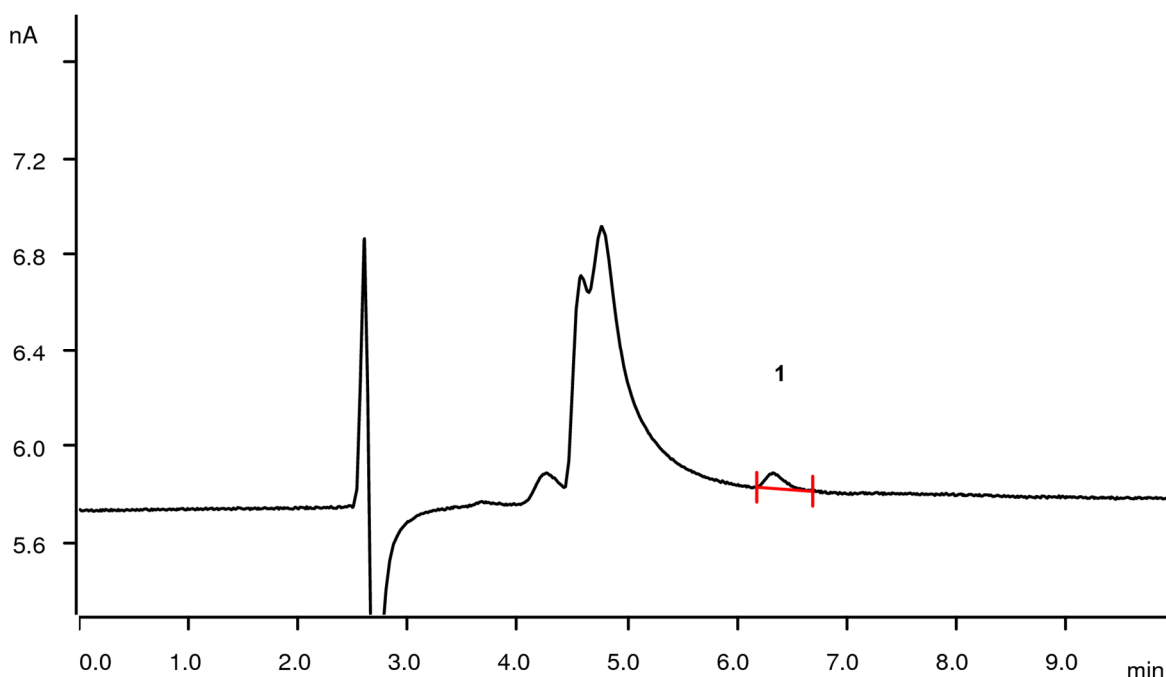


Cyanide in wastewater with micro-distillation applying amperometric detection

Determination of total cyanide in wastewater is performed by amperometric detection after micro-distillation applying a gold working electrode.



Chromatogram of the distillate sample containing cyanide.

Cyanide in wastewater is an important parameter to measure for health requirements. Free, weakly complexed, and strongly complexed cyanide can be differentiated. Direct measurement in the wastewater is not feasible due to the matrix itself. Therefore, total cyanide is determined after acidification of the sample, which releases all cyanide from complexes, and subsequent distillation and absorption of cyanide in an alkaline solution. Amperometric detection is applied using a gold working electrode. This electrode is advantageous over the silver electrode due to less contamination issues and better long-term stability.

Results

Sample	Concentration [$\mu\text{g/L}$]	Spiked* [$\mu\text{g/L}$]	Recovery [%]
Cyanide	0.21	1 st	19.25
		2 nd	20.38

* The sample is split into three parts. One part is injected directly, the others are spiked individually, each with 20 $\mu\text{g/L}$.

Sample

Wastewater

Sample preparation

The wastewater is first acidified to totally release cyanide. Afterwards, the sample is distilled and the cyanide is absorbed in an alkaline solution. Then it is injected into the ion chromatograph.

Columns

Metrosep A Supp 10 - 250/2.0	6.1020.230
Metrosep A Supp 10 Guard/2.0	6.1020.600

Solutions

Eluent	1.0 mol/L sodium hydroxide 0.1 mmol/L EDTA
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Instrumentation

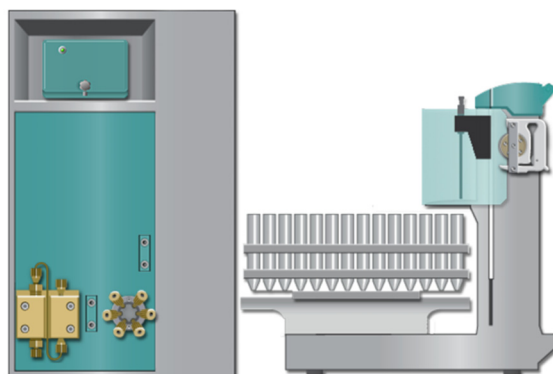
930 Compact IC Flex Deg	2.930.1160
IC Amperometric Detector	2.850.9110
919 IC Autosampler plus	2.919.0020
IC equipment Wall-Jet cell: Carb (Au, Pd)	6.5337.010

Analysis

DC amperometric detection

Parameters

Flow rate	0.25 mL/min
Injection volume	5 µL
P _{max}	25 MPa
Detector temperature	35 °C
Column temperature	ambient
Recording time	8 min
Detection mode	DC
Potential	0.0 V
Range	Auto



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