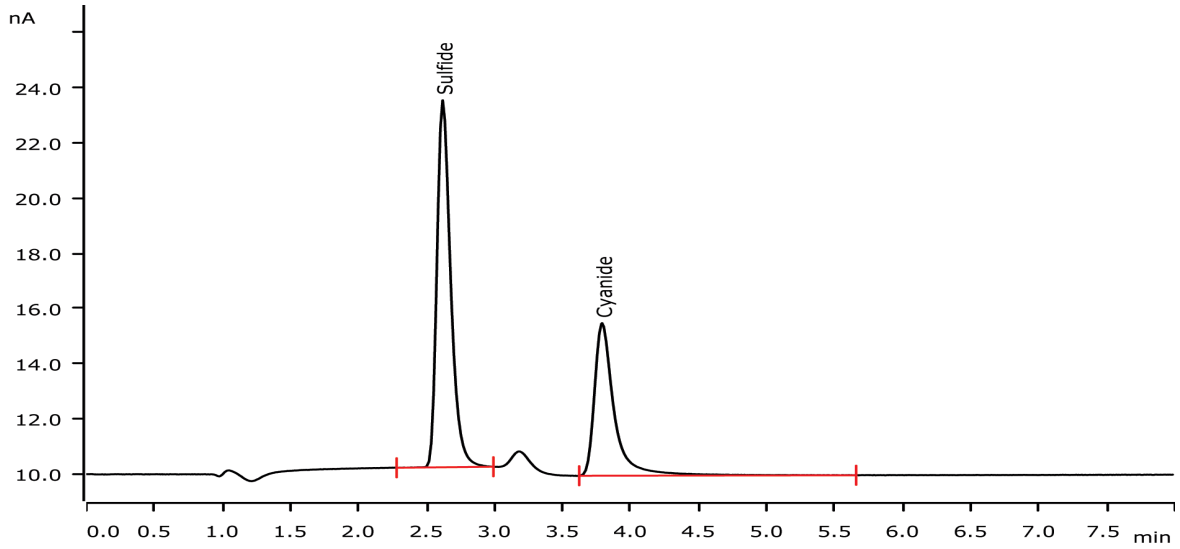
IC Application Note P–52

# Trace analysis of cyanide and sulfide in aqueous samples

## DC amperometric determination after ion chromatographic separation




Sulfide and cyanide are toxic anions. Their trace determination in any kind of water samples, especially in wastewater, is requied for safety reasons. However, metal traces present in the eluent can mask target anions due to complexation. The addition of a stronger complexing agent to the eluent mask these metal cations enabling interference free determaination. This application is mainly used for the analysis of cyanide and/or sulfide in water. However, it also fulfills the requirements of ASTM D2036 for the determination of total, amenable, weak acid dissociable cyanides. The determination of cyanide and sulfide require an alkaline eluent and amperometric detection. This Application Note describes a new column/eluent combination for optimized separation. The combination consists of the Metrosep A Supp 10 - 100/4.0 column and a sodium hydroxide eluent containing a trace of EDTA for transition metal complexation. This yields in better peak shape and detection limits below 0.1 µg/L.

## Results

| Compound | Concentration [µg/L] |
|---|---|
| Sulfide | 10.0 |
| Cyanide | 10.0 |

Metrohm

## Sample

Standard solution

## Sample preparation

Direct injection

## Columns

| | |
|---|---|
| Metrosep A Supp 10 - 100/4.0 | 6.1020.010 |
| Metrosep A Supp 10 Guard/4.0 | 6.1020.500 |

## Solutions

| | |
|---|---|
| Eluent | 100 mmol/L sodium hydroxide<br>0.01 mmol/L EDTA |

## Parameters

| | |
|---|---|
| Flow rate | 1.0 mL/min |
| Injection volume | 20 µL |
| Recording time | 5 min |
| Column temperature | 35 °C |

## PAD Parameters

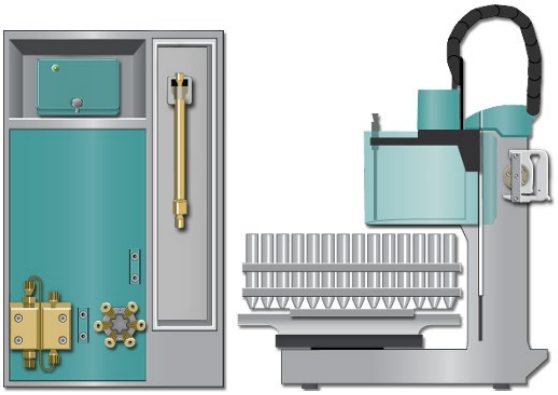
| | |
|---|---|
| Cell | Wall-Jet cell |
| Working electrode | Silver |
| Reference electrode | Palladium |
| Spacer | 50 µm |
| Measuring potential | 0.0 V |
| Measuring range | Auto |
| Temperature | 35 °C |
| Mode | DC |
| Measuring mode | Current |

## Analysis

Amperometric detection

## Instrumentation

| | |
|---|---|
| 930 Compact IC Flex Oven/Deg | 2.930.2160 |
| IC Amperometric Detector | 2.850.9110 |
| 858 Professional Sample Processor | 2.858.0020 |
| IC equipment Wall-Jet cell: Cyanide (Ag, Pd) | 6.5337.020 |



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