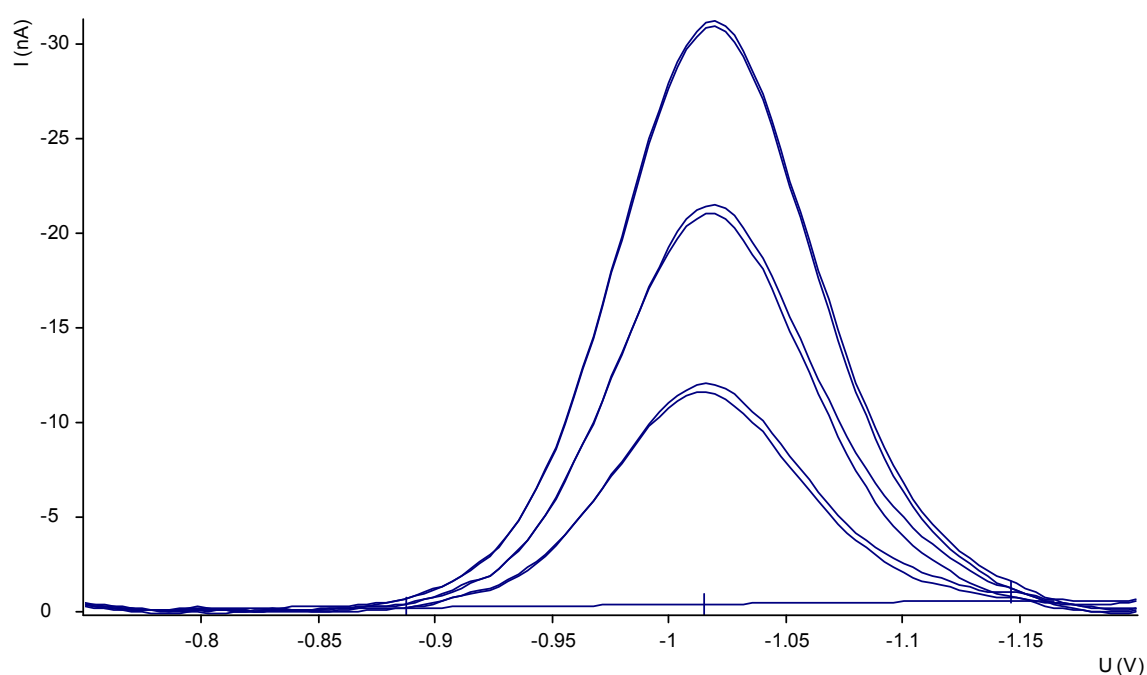


Total iron in waste water after UV digestion (Triethanolamine-bromate-method)



The concentration of Fe(total) is determined in waste water after UV digestion. The method is suitable for iron concentrations down to the low $\mu\text{g/L}$ range. Stripping voltammetry is not applicable for this method. Fe(II) and Fe(III) give signals with the same sensitivity.

Results

Fe(total) in waste water

220 $\mu\text{g/L}$

Method description

Sample

Waste water

trace analysis*, w(NaOH) = 30%

*e.g., Merck suprapur®, Sigma-Aldrich TraceSelect® or equivalent.

Instruments

797 VA Computrace & 909 UV Digester



Solutions

Electrolyte c(triethanolamine) = 0.05 mol/L
+ c(KBrO₃) = 0.1 mol/L
+ c(NaOH) = 0.3 mol/L

Analysis

Measuring solution 10 mL ultrapure water
+ 5 mL electrolyte
+ 1 mL digested waste water sample

Sample preparation

10 mL waste water sample, 50 µL HCl, and 50 µL H₂O₂ are pipetted into the 12 mL quartz sample vessels. The sample holder with the 12 quartz sample vessels is placed in the 909 UV Digester and irradiated at 90 °C for 60 min.

Parameters 909 UV Digester

Temperature	90 °C
Irradiation time	60 min

Electrodes

Multi-Mode Electrode pro	6.1246.120
Non-silanized capillaries	6.1226.030
Ag/AgCl/KCl (3 mol/L) reference electrode. Bridge electrolyte c(KCl) = 3 mol/L	6.0728.020 6.1245.010
Separate Pt rod electrode	6.0343.000

Parameters 797 VA Computrace

Working electrode	HMDE
Stirrer speed	2000 rpm
Mode	DP
Purge time	300 s
Equilibration time	10 s
Start potential	-0.75 V
End potential	-1.2 V
Pulse amplitude	0.05 V
Pulse time	0.04 s
Voltage step	0.004 V
Voltage step time	0.25 s
Sweep rate	0.016 V/s
Peak potential Fe	-1.0 V

Reagents

HCl	Hydrochloric acid, for trace analysis*, w(HCl) = 30%
H ₂ O ₂	Hydrogen peroxide solution, for trace analysis*, w(H ₂ O ₂) = 30%
N(CH ₂ CH ₂ OH) ₃	Triethanolamine, 99.5%
KBrO ₃	Potassium bromate, 99.8%
NaOH	Sodium hydroxide solution, for

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