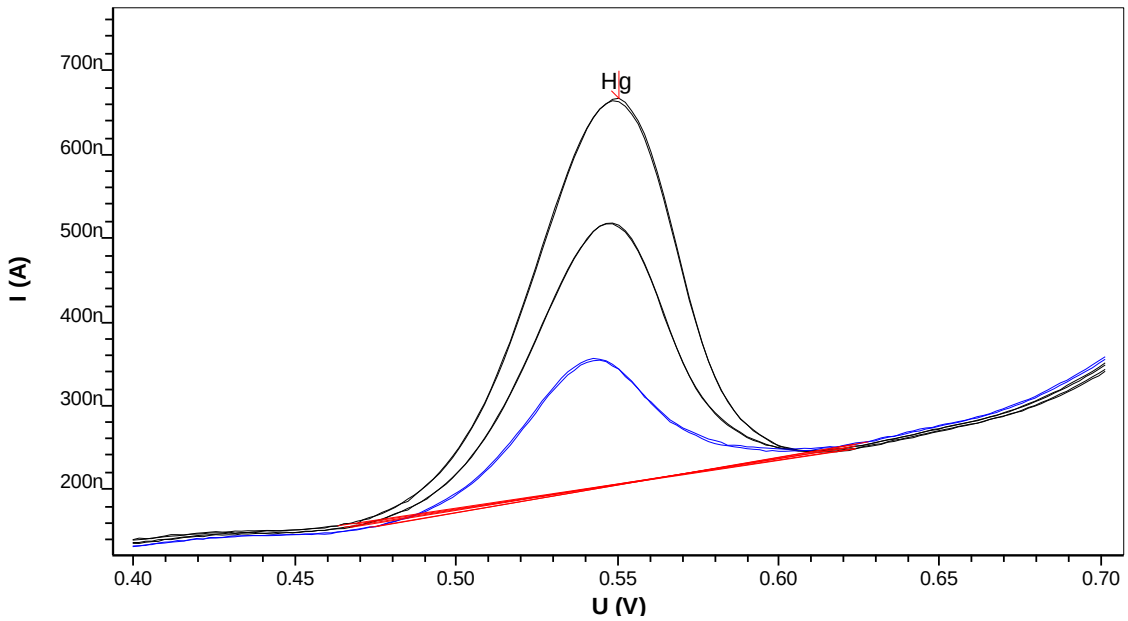
VA Application Note V-89

Mercury in waste water



Mercury can be determined in waste water by anodic stripping voltammetry (ASV) on a gold rotating disk electrode (Au RDE). Waste water has to be digested with hydrochloric acid and hydrogen peroxide by UV irradiation before measurement.

Results

Hg in waste water
4.97 µg/L

Metrohm

Method description

Sample

Waste water

Instruments

797 VA Computrace & 909 UV Digester

Sample preparation

For UV digestion 10 mL waste water, 10 µL HCl, and 50 µL H_2O_2 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. The samples are irradiated at 90 °C for 60 min.

Parameters 909 UV Digester

Temperature	90 °C
Irradiation time	60 min

Electrodes

Driving axle for rotating disc electrode	6.1204.210
Gold electrode tip	6.1204.140
Ag/AgCl/KCl (3 mol/L) reference electrode. Bridge electrolyte c(NaCl) = 3 mol/L	6.0728.020 6.1245.010
Glassy carbon rod	6.1247.000
Electrode holder	6.1241.020

Reagents

HCl	Hydrochloric acid, for trace analysis*, w(HCl) = 30%
H_2O_2	Hydrogen peroxide solution, for trace analysis*, w(H_2O_2) = 30%
H_2SO_4	Sulfuric acid, for trace analysis*, ≥95%
EDTA	Ethylenediaminetetraacetic acid disodium salt dihydrate, 99%

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

Solutions

Supporting electrolyte	c(H_2SO_4) = 2 mol/L c(Na_2EDTA) = 0.02 mol/L c(NaCl) = 0.05 mol/L

Analysis

Measuring solution	10 mL digested sample + 1 mL supporting electrolyte

Parameters 797 VA Computrace

Working electrode	RDE
Stirrer speed	2000 rpm
Mode	DP
Purge time	30 s
Cleaning potential	0.7 V
Cleaning time	10 s
Deposition potential	0.37 V
Deposition time	30 s
Equilibration time	5 s
Start potential	0.4 V
End potential	0.7 V
Pulse amplitude	0.05 V
Pulse time	0.04 s
Voltage step	0.002 V
Voltage step time	0.1 s
Sweep rate	0.02 V/s
Peak potential Hg	0.55 V

Literature

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