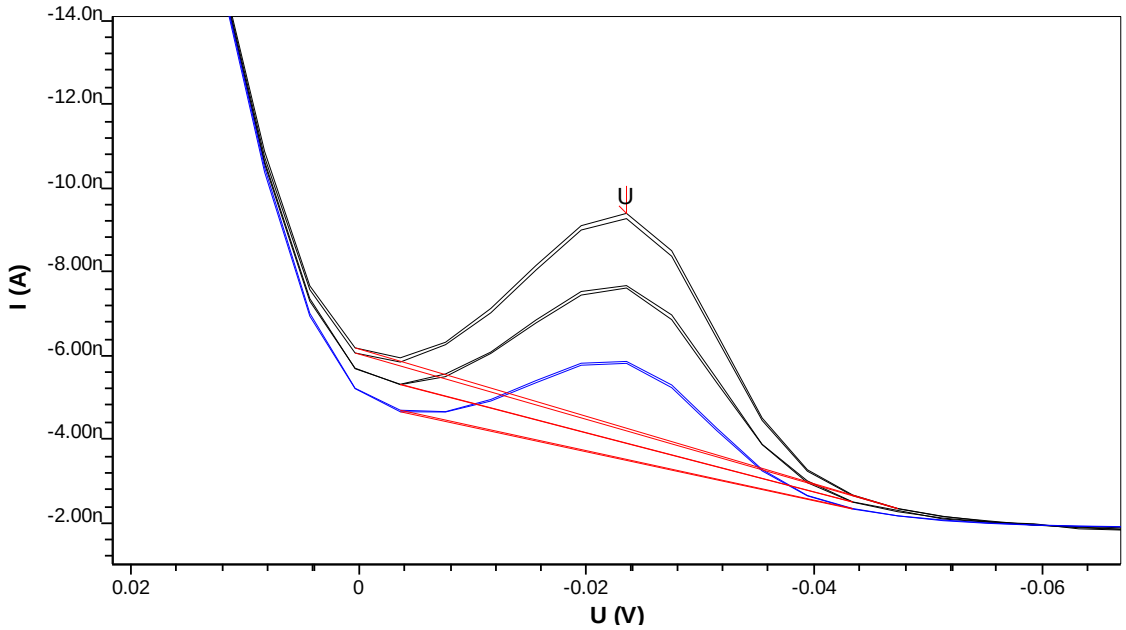
VA Application Note V-45

Uranium in drinking water



Uranium can be determined in drinking water by adsorptive stripping voltammetry (AdSV) at the hanging mercury drop electrode (HMDE). Chloranilic acid is used as complexing agent.

Results

U in drinking water
0.40 µg/L

Metrohm

Method description

Sample

Drinking water

Instruments

797 VA Computrace

Electrodes

Multi-Mode Electrode pro Silanized capillaries	6.1246.120 6.1226.050
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

Reagents

$NaNO_3$	Sodium nitrate, 99%
HNO_3	Nitric acid, for trace analysis*, w(HNO_3) = 65%
Chloranilic acid	Chloranilic acid, 99%

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

Solutions

Sodium nitrate solution	c($NaNO_3$) = 1 mol/L
Diluted nitric acid	c(HNO_3) = 0.5 mol/L
Chloranilic acid solution	c(Chloranilic acid) = 5 mmol/L

Analysis

Measuring solution	10 mL sample + 1 mL sodium nitrate solution + 150 µL diluted nitric acid + 110 µL chloranilic acid solution

Parameters

Working electrode	HMDE
Drop size	4
Stirrer speed	2000 rpm
Mode	DP
Purge time	300 s
Deposition potential	0.1 V
Deposition time	60 s
Equilibration time	5 s
Start potential	0.05 V
End potential	-0.3 V
Pulse amplitude	0.05 V
Pulse time	0.04 s
Voltage step	0.004 V
Voltage step time	0.1 s
Sweep rate	0.04 V/s
Peak potential U	-0.1 V