

# VA Application Note No. V - 174

**Title:** Total arsenic in zinc plant electrolyte

**Summary:**

The concentration of As(total) in zinc plant electrolyte is determined by anodic stripping voltammetry (ASV) on a lateral gold electrode in HCl electrolyte. Due to the high excess of zinc in the sample the deposition potential has to be adapted. A second potential approx. 100 mV more negative than the arsenic signal has to be applied to selectively oxidize interfering antimony.

For sample preparation the sample was passed through a cation exchange column to reduce the concentration of zinc in the measuring solution.

**Sample:**

Zinc plant electrolyte

**Sample preparation:**

1 mL ultrapure water and 50 µL zinc plant electrolyte are passed through a sample preparation cartridge IC-H (6.1012.110) with a flow rate of 1 mL/min. After the elution the cartridge is rinsed with two times 2 mL ultrapure water. The rinsing solution is also collected for analysis.

## Analysis of As

<b>HCl solution</b>	w(HCl) = 30%	
<b>Measuring solution</b>	5 mL prepared sample solution + 5 mL HCl solution	
<b>Working electrode (WE)</b>	<b>Au-RDE:</b>	
	drive shaft	6.1246.000
	Au tip for arsenic determination	6.1204.150
<b>Auxiliary electrode (AE)</b>	<b>GC</b>	
	electrode holder	6.1241.020
	glassy carbon rod	6.1247.000
<b>Reference electrode (RE)</b>	Reference system: Ag/AgCl/KCl (3 mol/L)	6.0728.020
	Intermediate electrolyte: c(KCl) = 3 mol/L	6.1245.010
<b>Parameters</b>	Working electrode	RDE
	Stirrer speed	2000 rpm
	Mode	DP
	Purge time	300 s
	Cleaning potential	0.4 V
	Cleaning time	30 s

Deposition potential 1	-1.0 V
Deposition time 1	120 s
Deposition potential 2	0.04 V
Deposition time 2	10 s
Equilibration time	2 s
Pulse amplitude	0.05 V
Start potential	-0.1 V
End potential	0.3 V
Voltage step	0.006 V
Voltage step time	0.2 s
Sweep rate	0.03 V/s
Peak potential As	0.13 V

<b>Results:</b>	As
	139 µg/L

### Determination of As

