VA Application Note No. V-111

Title:	**Germanium in zinc plant electrolytes (concentrated $ZnSO_4$ solutions)**

Summary:	Germanium is determined by adsorptive stripping voltammetry (AdSV) at the HMDE using aqueous sulfuric acid as supporting electrolyte and pyrocatechol violet as complexing agent. It is possible to determine 20 µg/L Ge in a sample containing 150 g/L Zn, 3 g/L Cd and 1 mg/L Pb.

Sample:	Zinc plant electrolyte
Sample preparation:	none

Determination of germanium

Electrolyte

PCV solution:
c(pyrocatechol violet) = 10^{-3} mol/L

Measuring solution

5 mL sample
+ 5 mL ultrapure water
+ 0.3 mL w(H_2SO_4) = 96% (suprapur)
+ 50 µL PCV solution

The final concentration of sulfuric acid in the measuring solution is c(H_2SO_4) = 0.54 mol/L (approx. pH = 0.4).

Auxiliary electrode (AE)

Pt

Reference electrode (RE)

Ag/AgCl/KCl (3 mol/L)

Parameters

Working electrode	HMDE
Stirrer speed	2000 rpm
Mode	DP
Purge time	300 s
Deposition potential	–200 mV
Deposition time	60 s
Post electrolysis potential	–250 mV
Post electrolysis time	5 s
Equilibration time	10 s
Pulse amplitude	50 mV
Start potential	–200 mV
End potential	–450 mV

	Voltage step	6 mV
	Voltage step time	0.1 s
	Sweep rate	60 mV/s
	Peak potential Ge	–340 mV

Results:	Ge
	20 µg/L

Literature:	Alan M. Bond, Steven Kratsis, O. Michael G. Newman Adsorptive stripping voltammetric determination of germanium in zinc plant electrolyte Electroanalysis 10/6 (1998), 387–391

Determination of Ge