VA Application Note No. V - 118

Title:	Gold in ammonium thiosulfate solution

Summary:	Gold can be determined by anodic stripping voltammetry (ASV) in the µg/l range at the Ultra Trace Graphite electrode. The solution should not contain halide ions.

Sample:	ammonium thiosulfate solution
Sample preparation:	2 mL sample and are heated in a porcelain cup to approx. 120° C and evaporated to dryness. Then it was ashed in a muffle furnace at 650°C for 2 hours. The residue was mixed with 2 mL w(HNO_3) = 65 % suprapur and 1 mL w(H_2SO_4) = 96% suprapur and heated until SO_3 vapors are evolved. After cooling once more 2 mL of w(HNO_3) = 65 % suprapur were added and evaporated almost to dryness. After cooling 25 mL ultrapure water were added and the solution was boiled for 1 min. 1 mL of c(EDTA-Na_2) = 0.1 mol/L was added to the cold solution. The solution was filled up with water to 50 mL.

Analysis of Au

Electrolyte	c(KNO_3) = 0.2 mol/L + c(Na_2-EDTA) = 0.04 mol/L	
Measuring solution	7.5 mL ultrapure water + 1 mL digestion solution + 2.5 mL electrolyte The pH is adjusted to 3.8 with c(NaOH) = 2 mol/L	
Auxiliary electrode (AE)	Glassy Carbon (GC)	
Reference electrode (RE)	Ag/AgCl/KCl (3 mol/L) Bridge electrolyte : KNO_3 sat.	
Parameters	Working electrode	Ultra Trace RDE
	Stirrer speed	2000 rpm
	Mode	DP
	Purge time	300 s
	Deposition potential	-400 mV
	Deposition time	120 s

	Deposition potential (without stirring)	-600 mV
	Deposition time without stirring = Equilibration time	25 s
	Pulse amplitude	50 mV
	Start potential	-400 mV
	End potential	+500 mV
	Voltage step	4 mV
	Voltage step time	0.1 s
	Sweep rate	40 mV/s
	Cleaning potential	+500 mV
	Cleaning time	60 s
	Peak potential Au	+150 mV

Results:	Au
	702 µg/L

Determination of Au