

VA Application Note No. V-87

Title:	Nickel and cobalt in drinking water using adsorptive stripping voltammetry
---------------	---

Summary:	Nickel and cobalt can be determined in drinking water in one run by adsorptive stripping voltammetry (AdSV). Dimethylglyoxime (DMG) is used as complexing agent at a pH value of 9.3.
-----------------	---

Sample:	Drinking water
----------------	----------------

Sample preparation:	none
----------------------------	------

Determination of nickel and cobalt

Electrolyte Ammonia buffer:
 $c(\text{HCl}) = 1 \text{ mol/L} + c(\text{NH}_3) = 3 \text{ mol/L}$
 DMG solution:
 $c(\text{dimethylglyoxime disodium salt}) = 0.1 \text{ mol/L}$ in water

Measuring solution 10 mL drinking water
 + 0.5 mL ammonia buffer
 + 50 μL DMG solution
 → pH = 9.3

Working electrode (WE) **MME** (Multi-Mode Electrode) 6.1246.020

Auxiliary electrode (AE) **Pt** 6.0343.000

Reference electrode (RE) Ag/AgCl/KCl (3 mol/L): 6.0728.020 + 6.1245.010

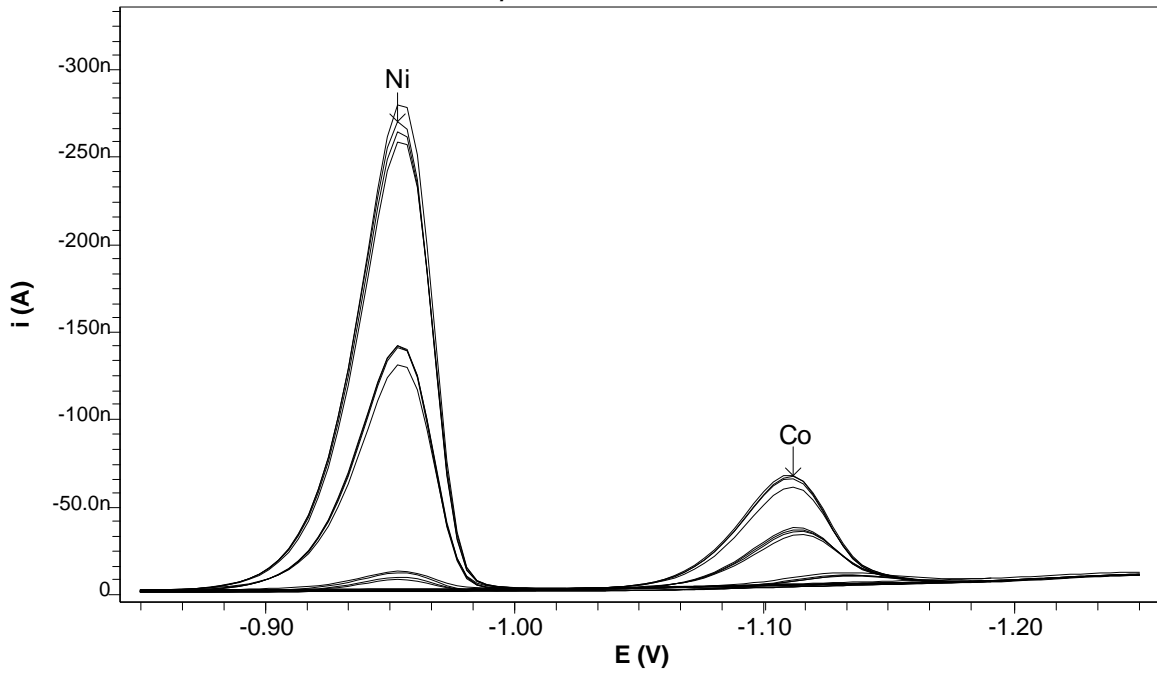
Parameters

Working electrode	HMDE
Stirrer speed	2000 rpm
Mode	DP
Purge time	300 s
Deposition potential	-750 mV
Deposition time	60 s
Equilibration time	5 s
Pulse amplitude	50 mV
Start potential	-850 mV
End potential	-1250 mV
Voltage step	4 mV
Voltage step time	0.3 s
Sweep rate	13.3 mV/s
Peak potential Ni	-960 mV
Peak potential Co	-1150 mV

Results:	Ni	Co
	340 ng/L	210 ng/L

Determination of Ni and Co

Determination of Ni,Co in tap water
tap water_nico_no5



Ni
c = 342.187 ng/l
+/- 76.096 ng/l (22.24%)

Co
c = 209.614 ng/l
+/- 14.989 ng/l (7.15%)

