

VA Application Note No. V - 128

Title:	Determination of total iron in the ppm range in a chromium electroplating bath
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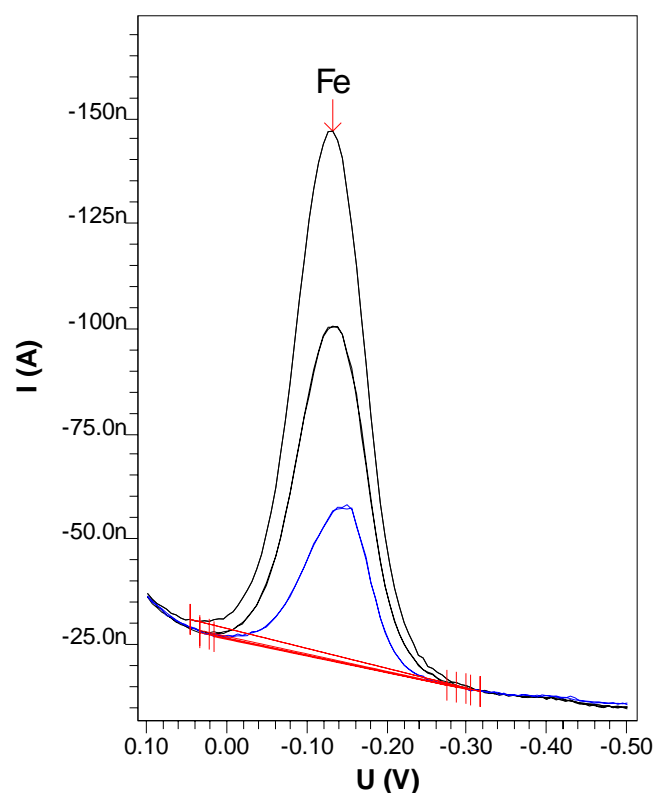
Summary:	<p>The concentration of Fe(total) is determined polarographically in a chromium electroplating bath. The method is suitable for iron in concentrations in the ppm range.</p> <p>Fe(II) and Fe(III) show signals with the same sensitivity.</p>
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Sample:	Chromium electroplating bath
Sample preparation:	<p>Reduction of Cr(VI)</p> <p>250 µL Cr bath are diluted to 25 mL with oxalic acid (0.5 mol/L). The solution is slowly heated up while stirring until the color changes.</p>

Analysis of Fe(total)		
Oxalate buffer pH 2.0	c(ammonium oxalate) = 0.1 mol/L → adjusted to pH 2 with H ₂ SO ₄	
Measuring solution	5 mL ammonium oxalate solution + 5 mL ultrapure water + 250 µL reduced sample	
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	DME
	Stirrer speed	2000 rpm
	Mode	DP
	Purge time	300 s
	Deposition potential	
	Deposition time	0
	Equilibration time	5 s
	Pulse amplitude	50 mV
	Start potential	+0.1 V
	End potential	-0.5 V
	Voltage step	6 mV
	Voltage step time	0.6 s
	Sweep rate	10 mV/s
	Peak potential Fe	-150 mV

Results:	Fe
	3.5 g/L

Determination of Fe



Fe
c = 3.496 g/L
+/- 0.047 g/L (1.34%)

