VA Application Note No. V - 177

Title:	**Total iron in a chromium bath (triethanolamine-bromate-method)**

Summary:	The concentration of Fe(total) is determined by polarography in alkaline electrolyte containing triethanolamine (TEA) and $KBrO_3$. All reagents typically contain Fe impurities. Therefore a subtraction of the reagent blank is recommended.

Sample:	Cr(III/VI) electroplating bath
Sample preparation:	**Reduction of Cr(VI)** 250 µL Cr bath is filled up to 25 mL with c(oxalic acid) = 0.5 mol/L. The solution is gently heated while stirring until the color changes.

Analysis of Fe(total)

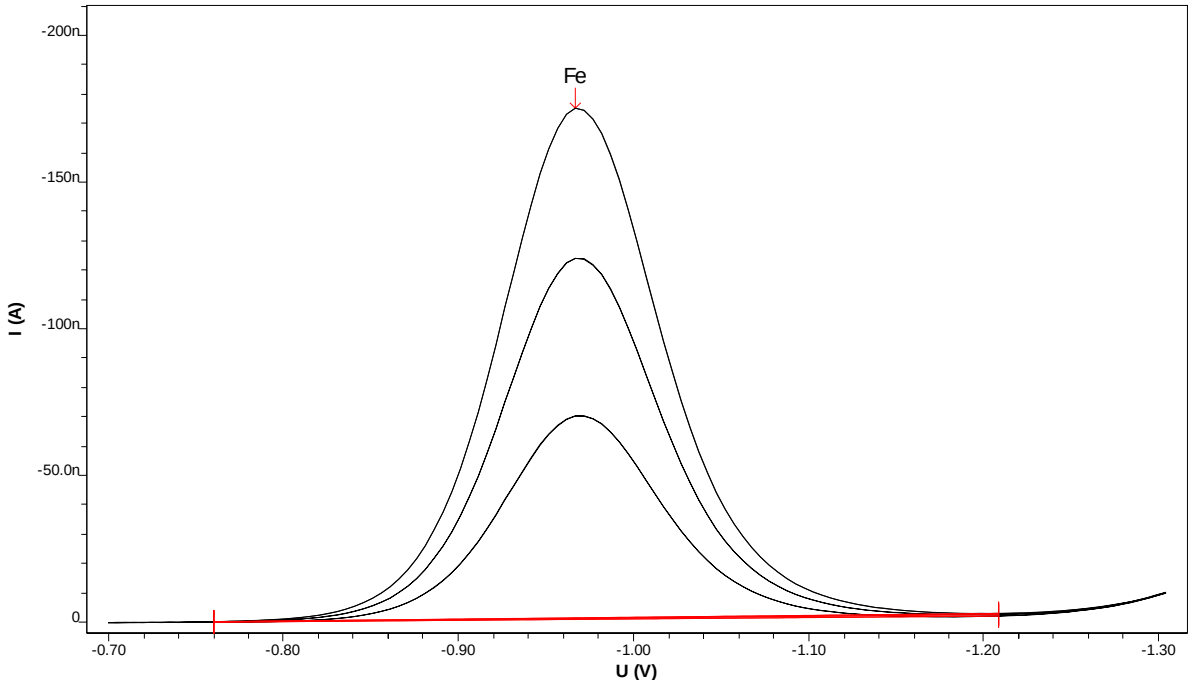
Supporting electrolyte	c(NaOH) = 0.3 mol/L c($KBrO_3$) = 0.1 mol/L c(TEA) = 0.05 mol/L *TEA: triehanolamine*	
Measuring solution	15 mL H_2O + 5 mL supporting electrolyte + 50 µL reduced Cr bath	
Working electrode (WE)	**MME** (Multi Mode Electrode)	6.1246.020
Auxiliary electrode (AE)	**Pt**	6.0343.000
Reference electrode (RE)	Reference system: Ag/AgCl/KCl (3 mol/L) Intermediate electrolyte: c(KCl) = 3 mol/L	6.0728.020 6.1245.010

Parameters

Working electrode	DME
Stirrer speed	2000 rpm
Mode	DP
Purge time	300 s
Equilibration time	5 s
Pulse amplitude	0.05 V
Start potential	-0.7 V
End potential	-1.3 V
Voltage step	0.005 V
Voltage step time	0.8 s
Sweep rate	0.0062 V/s
Peak potential Fe	-0.95 V

Results:	Fe (blank subtracted)
	1.5 g/L

Determination of Fe(total)

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Fe
c =     2.604 g/L
+/-     0.022 g/L (0.83%)
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