VA Application Note No. V - 186

Title:	**Chromium(VI) in electronic components as part of electrotechnical products**

Summary:	The EU directive on «Restriction of Hazardous Substances» (RoHS) requires the testing of four regulated heavy metals (Pb, Hg, Cd, Cr(VI)) in electrotechnical products. After sample preparation according to IEC 62321 the determination of chromium(VI) in electronic components can be carried out by polarography in ammonia buffer pH 9.6.

Sample:	Electronic components
Sample preparation:	Approx. 5 g of the ground sample is extracted with an alkaline sodium carbonate solution as described in IEC 62321.

Analysis of Cr(VI)

Electrolyte

Ammonia buffer pH 9.6
$c(NH_3)$ = 2 mol/L
$c(NH_4Cl)$ = 1 mol/L

Measuring solution

5 mL ultrapure water
+ 5 mL ammonia buffer pH 9.6
+ 0.1 mL extraction solution
(equals approx. 5 mg of ground sample)

Working electrode (WE)	**MME** (Multi Mode Electrode)	6.1246.020
	With silanized capillary	6.1226.050
Auxiliary electrode (AE)	**Pt**	6.0343.000
Reference electrode (RE)	Reference system: Ag/AgCl/KCl (3 mol/L)	6.0728.020
	Intermediate electrolyte: c(KCl) = 3 mol/L	6.1245.010

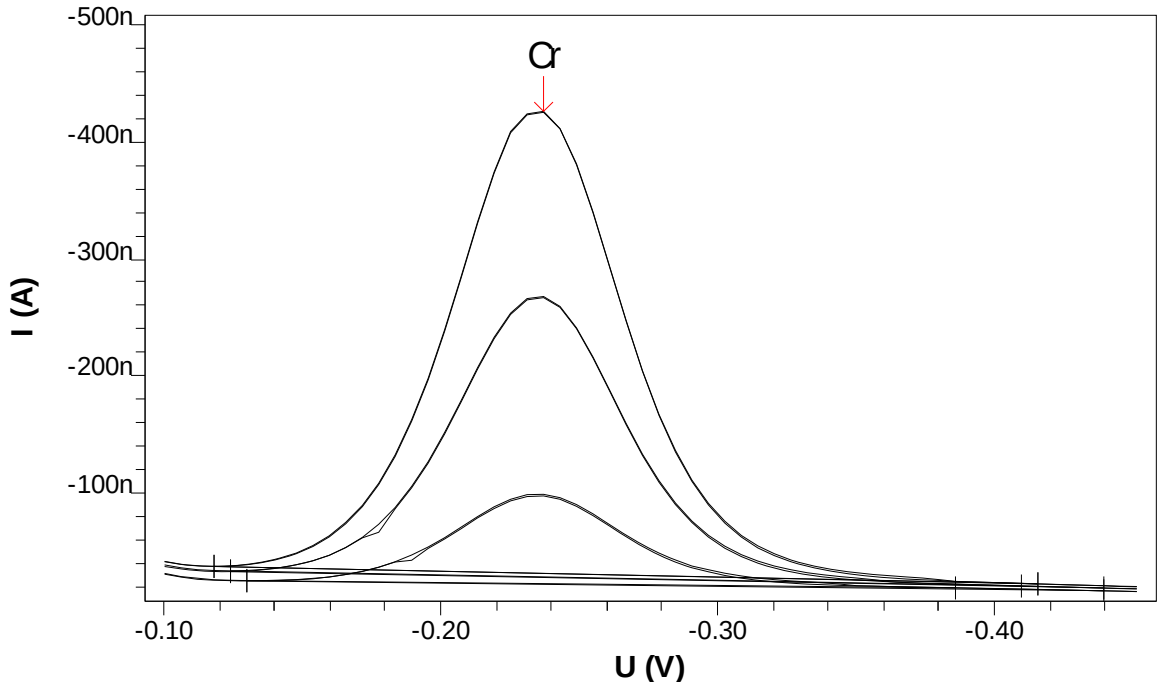
Parameters

Working electrode	DME
Stirrer speed	2000 rpm
Mode	DP
Purge time	300 s
Equilibration time	5 s
Pulse amplitude	0.05 V
Start potential	-0.1 V
End potential	-0.45 V
Voltage step	0.006 V

	Voltage step time	0.6 s
	Sweep rate	0.01 V/s
	Peak potential Cr(VI)	-0.25 V

Results:	Cr(VI)
	934.8 mg/kg

Determination of Cr(VI)



Cr
c = 934.791 mg/kg
+/- 14.742 mg/kg (1.58%)