VA Application Note No. V - 189

Title:	**Chromium(VI) in polymer materials 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 polymer materials can be carried out by polarography in ammonia buffer pH 9.6.

Sample:	Polymer materials
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) With silanized capillary	6.1246.020 6.1226.050
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

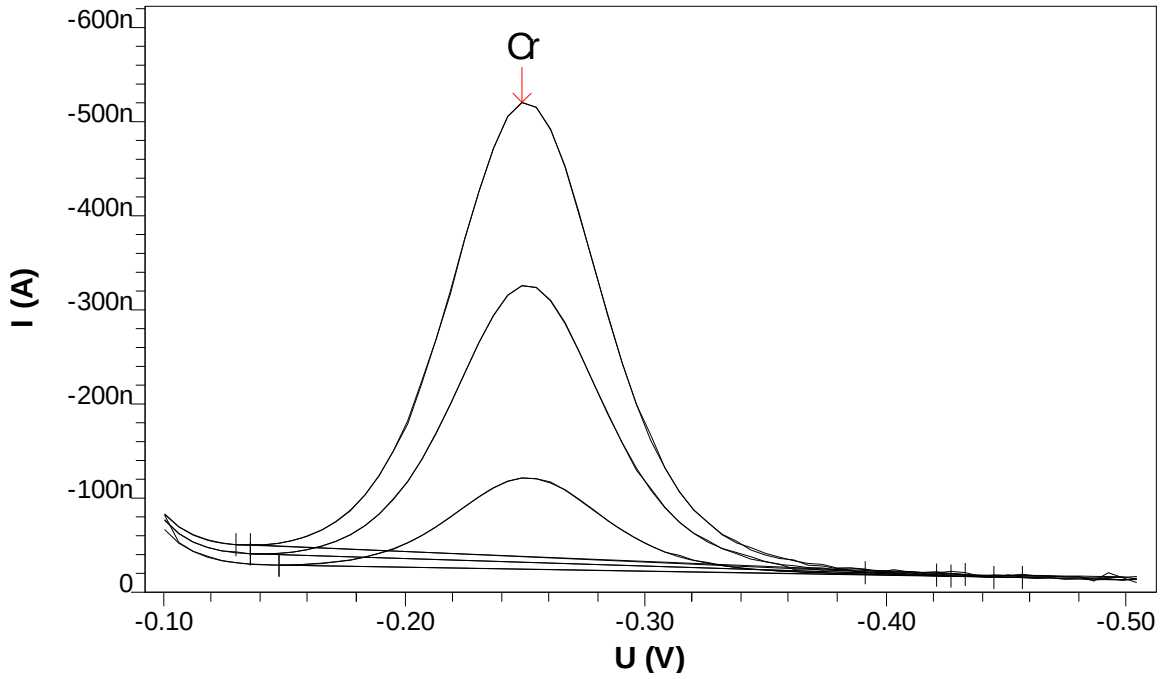
Parameters

Working electrode	DME
Stirrer speed	2000 rpm
Mode	DP
Purge time	300 s
Equilibration time	5 s
Pulse amplitude	0.05 V
Start potential	-0.1 V
End potential	-0.5 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)
	985.0 mg/kg

Determination of Cr(VI)

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Cr
c =  985.045 mg/kg
+/-    7.904 mg/kg (0.80%)
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