VA Application Note No. V - 113

Title:	Titanium in PET (polyethylene terephthalate)

Summary:	Ti is determined in polyethylene terephthalate (PET) after digestion in sulfuric acid and hydrogen peroxide. Adsorptive stripping voltammetry (AdSV) with mandelic acid as complexing agent is used for this application.

Sample:	PET pellets
Sample preparation:	250 mg sample 2 mL w(H_2SO_4) = 96 % suprapur are put into a flask of the digestion apparatus and heated to 250°C. 1 mL w(H_2O_2) = 30% suprapur is added through a dropping funnel. The mixture reacts intensively. Another 1 mL H_2O_2 is added. After the 2nd addition the mixture was heated to 400° C until SO_3 fumes are formed and the solution remains colorless. After cooling down the solution was filled up to 100 mL.

Analysis of Ti

Electrolyte	c(mandelic acid) = 0.4 mol/L in water	
Measuring solution	10 mL water + 10 µL digestion solution + 1 mL electrolyte adjust the pH to 3.1 with w(NH_3) = 10%.	
Auxiliary electrode (AE)	Pt	
Reference electrode (RE)	Ag/AgCl/KCl (3 mol/L)	
Parameters	Working electrode	HMDE
	Stirrer speed	2000 rpm
	Mode	DP
	Purge time	300 s
	Deposition potential	-600 mV
	Deposition time	30 s
	Equilibration time	5 s
	Pulse amplitude	50 mV

	Start potential	-600 mV
	End potential	-950 mV
	Voltage step	6 mV
	Voltage step time	0.1 s
	Sweep rate	60 mV/s
	Peak potential Ti	-770 mV

Results:	Ti
	4.8 mg/g

Determination of Ti