Determination of chloride in electroplating samples

Description

The chloride content is determined by titration with an aqueous silver nitrate solution. Acidification of the sample is not necessary for electroplating samples, as the sample already contains sufficient acid. Polyvinyl alcohol can be added to the sample to improve dispersion and prevent deposits on the electrode. If necessary, the addition can be omitted.

The calculation is made in g/l chloride.

Instruments

Titrator	TL 5000, TL 7000 or higher
Exchangeable head	WA 20
Electrode	AgCl 62 RG
Cable	L 1 A
Stirrer	Magnetic stirrer TM 235 / TM 50
Lab accessory	Glass beaker 150 ml
	Magnetic stirrer bar 30 mm

Reagents

1	AgNO3 0,1 mol/l
2	Deionized water
3	Polyvinyl alcohol - solution 0.5%
4	
All reagents should be of analytical grade or better.	

Titration Procedure

Reagents

The titer determination of the AgNO3 solution is carried out as described in the application note “Titer determination of AgNO3”.

Cleaning of the electrode

The electrode is cleaned with deionized water. The AgCl 62 RG can be stored in deionized water.

Polyvinylalkohol – Lösung 0.5%
0.5 g Polyvinylalkohol werden in 100 ml destilliertem Wasser unter Erwärmung gelöst.

Sample preparation

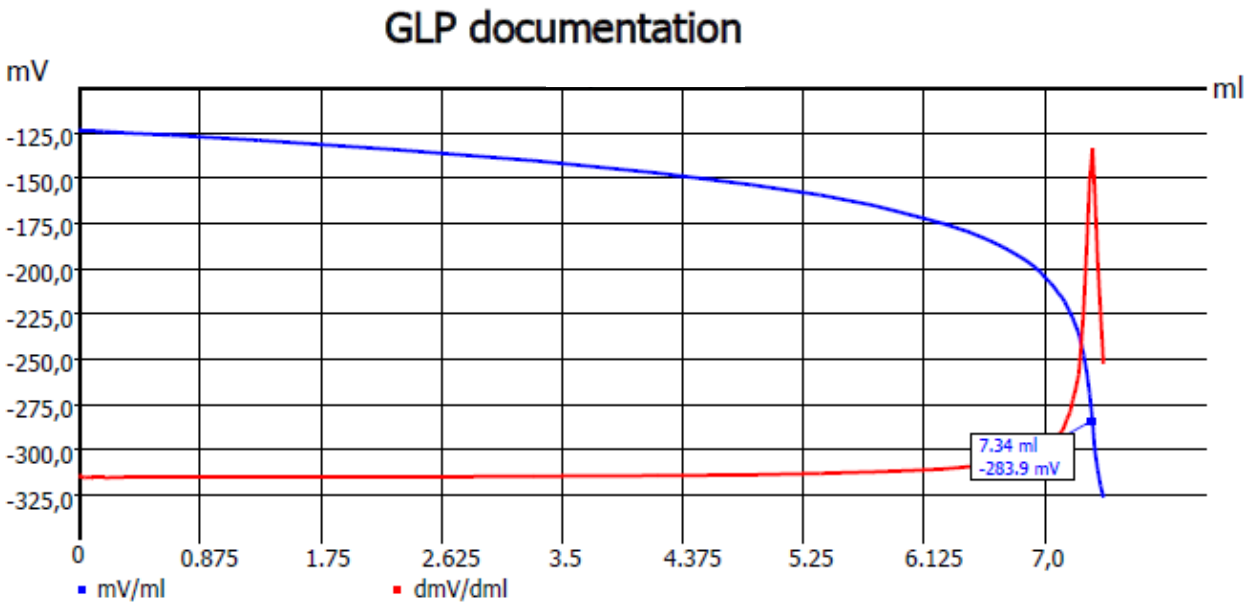
2 ml of the sample is pipetted into a 150 ml beaker, diluted with approx. 80 ml deionized water and titrated with a 0.1 molar AgNO3 solution.

Low-concentration samples can be titrated with a 0.01 molar AgNO3 solution. The sample quantity is increased to 50 - 100 ml depending on the expected concentration. The required sample quantity can be calculated using the following formula.

$$Sample\ volume\ [ml] = \frac{350 \cdot T\ (AgNO_3)}{expected\ concentration\ [\frac{g}{l}]}$$

Titration parameter

Sample titration



Default method	---		
Method type	Automatic titration		
Modus	Dynamic		
Measured value	mV		
Measuring speed / drift	User - defined	Minimum holding time	3 s
		Maximum holding time	15 s
		Measuring time	3 s
		Drift	10 mV/min
Initial waiting time	---		
Dynamic	Average	Max step size	1.0 ml
		Slope max ml	10
		Min. step size	0.02 ml
		Slope min. ml	120
Damping	none	Titration direction	increase
Pretitration	off	Delay time	0 s
End value	off		
EQ	On (1)	Slope value	150
Max. titration volume	50 ml		
Dosing speed	100%	Filling speed	30 s

The default method “Chlorides in mg/l” can be used as a basis. An adjustment of the calculation is necessary.

Calculation:

$$Cl\ [g/l] = \frac{(EQ1 - B) * T * M * F1}{V * F2}$$

B	0	Blank value
EQ1		Consumption of titrant at first Equivalence point
T	WA	Actual concentration of the titrant
M	35.45	Molecular mass of Cl
V	man	sample volume [ml]
F1	1	Conversion factor
F2	1	Conversion factor

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