

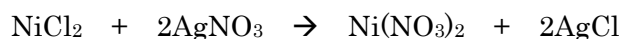
<b>AQUACOUNTER Application Sheet</b>	<b>COM series</b>	<b>DATA No. E4</b>	<b>1st edition</b>
<b>Plating</b>	<b>Quantification of nickel chloride (NiCl<sub>2</sub>) in nickel plating solution</b>		

## 1. Measurement outline

Control and analysis on nickel plating solution is an important work that affects the quality of product finishing. The general analysis components for nickel plating solution are as follows:

- (1) Nickel sulfate
- (2) Nickel chloride
- (3) Boric acid

This section introduces an example of potentiometric titration on nickel chloride in nickel plating solution with silver nitrate titrant.



## 2. Reagents and Electrodes

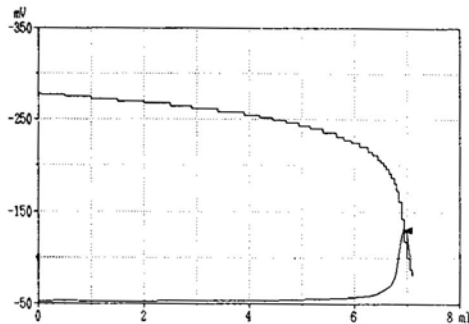
(1) Reagents	Titrant	0.1mol/L silver nitrate titrant
	Loading buffer	5mL (1 + 1) nitric acid 2mL silver chloride precipitate cohesion prevention agent
(2) Electrodes	Indicator electrode	Silver electrode AG-311 to IE jack (P/N E231245-A)
	Reference electrode	Silver reference electrode MS-231 to RE jack (P/N D231243-A)

## 3. Measurement conditions example (for COM-1600S)

<b>Master File No.1</b>	
<b>Condition file: 1</b>	
Method	AUTO
Amp No.	2
Buret No.	1
Meas Unit	mV
S-Timer	0 sec
CP	0 mL
DP	0 mL
End Sens	300
Over mL	0.50 mL
Max Vol	20 mL
Mode No.	5
Unit	g/L
Blank	0
Factor	Titer of the titrant
Molarity	0.1
K	58.44
Formula	(D-B)×F×K×M/S

<b>Mode No.5</b>	
Pre Int	0 sec
Del K	5
Del Sens	0 mV
Int Time	3 sec
Int Sens	3 mV
Brt Speed	2
Pulse	40

#### 4. Measurement example



#### Measurement results on NiCl<sub>2</sub>

Sample No.	Sample volume (mL)	Titration value (mL)	Concentration (g/L)
1	10	6.922	13.27
2	10	6.925	13.28
3	10	6.951	13.33
Avg.			13.29 g/L
Std. Dev.			0.032 g/L
C.V.			0.24 %

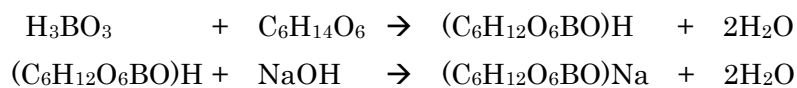
#### 5. Outline

##### (1) About NiCl<sub>2</sub> quantification method

As the quantification method on total nickel in nickel plating solution, photometric titration with 0.05mol/L EDTA titrant can be used by adding 10mL ammonia water to 1mL sample and then adding 50mL purified water and MX indicator.

##### (2) About boric acid quantification method

As the quantification method on boric acid in nickel plating solution, potentiometric titration with 0.1mol/L NaOH titrant can be used by adding 50mL purified water to 2mL sample and then adding 25mL mannite (saturated solution).



#### Key words

Plating solution, nickel plating solution, nickel chloride, quantification of boric acid

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