

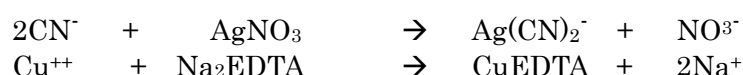
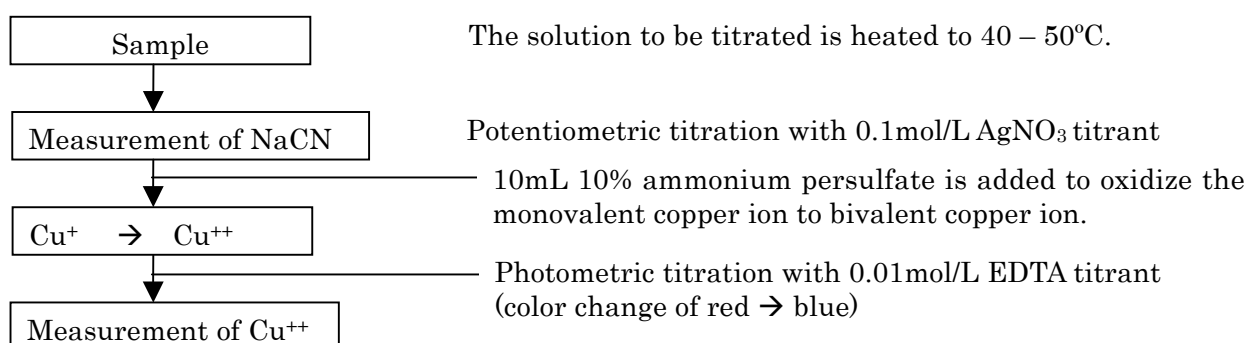
AQUACOUNTER Application Sheet	COM series	DATA No. E2	1st edition
Plating	Quantification of copper and sodium cyanide in copper cyanide plating solution		

1. Measurement outline

Analysis of copper cyanide plating solution is a daily analysis work that is important in controlling the quality of products and that affects the finishing quality of the product, and it needs to be implemented regularly. The general analysis items for copper cyanide plating solution are:

- (1) Copper cyanide
- (2) Sodium cyanide
- (3) Tartrate and Rochelle salt
- (4) Carbonate salt

This section introduces an example in which copper cyanide and sodium cyanide are quantified by fractionation titration with one sample collection. The analysis flow for this method is as follows:



2. Reagents and Electrodes

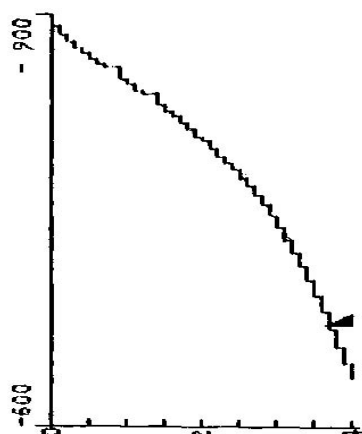
(1) Reagents	Titrant	0.1mol/L silver nitrate titrant (for NaCN analysis) 0.01mol/L EDTA titrant (for Cu ²⁺ analysis)
	Loading buffer	10mL 10% ammonium persulfate solution 10mL (1 + 1) ammonium water
	Indicator	0.2mL PAN indicator (0.1% ethanol solution)
(2) Electrodes	For sodium cyanide measurement: Silver reference combination electrode AGR-801 (P/N D231269-A) (electrolyte: saturated potassium sulfate solution)	
	For copper cyanide measurement: Photometric probe with 650nm filter	

3. Measurement conditions example (for COM-1600M photometric unit)

(1) Method	Auto	
(2) End Sens	100(NaCN)	300(Cu ²⁺)
(3) Mode	5	21
Pre Int	0	1
Del K	5	5
Del Sens	0	0
Int Time	3	3
Int Sens	3	3
Brt Speed	2	2
Pulse	40	80

4. Measurement example

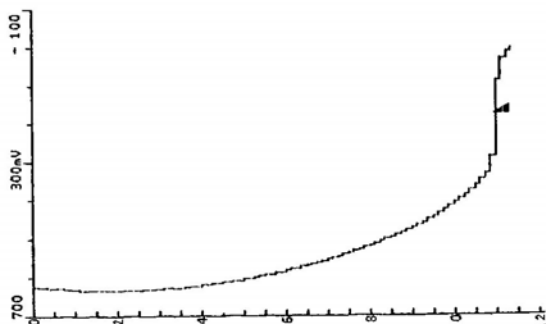
(1) Example of NaCN



Measurement results on NaCN

Sample No.	Sample volume (mL)	Titration value (mL)	Concentration (g/L)
1	1	3.6333	35.7
2	1	3.6000	35.4
3	1	3.6667	36.0
Avg.			35.7 g/L
Std. Dev.			0.30 g/L
C.V.			0.84 %

(2) Example of CuCN



Measurement results on CuCN

Sample No.	Sample volume (mL)	Titration value (mL)	Concentration (g/L)
1	1	10.952	98.1
2	1	10.971	98.1
3	1	11.004	98.5
Avg.			98.3 g/L
Std. Dev.			0.21 g/L
C.V.			0.21 %

5. Outline

About titration temperature

Titration of Cu²⁺ with EDTA titrant in this method was conducted by heating to approximately 40 – 50°C since its reaction speed is slow at room temperature.

Key words

Plating solution, copper cyanide plating solution, sodium cyanide, copper cyanide

Hitachi High-Technologies Corporation

Head Office 1-24-14, Nishishinbashi, Minato-Ku, Tokyo 105-8717, Japan

Tel : 81-3-3504-7239 Fax : 81-3-3835-7302

<http://www.hitachi-hitech.com>

Hiranuma Sangyo Co., Ltd.

1739, Motoyoshidacho, Mito-City, Ibaraki 310-0836, Japan

Tel : 81-29-247-6411 Fax : 81-29-247-6942

<http://www.hiranuma.com>