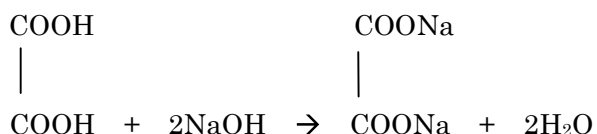


AQUACOUNTER Application Sheet	COM series	DATA No. F7	1st edition
Electronics	Quantification of oxalic acid in lead frame treatment solution for IC		

1. Measurement outline

The surface treatment solution for IC lead frames contain trace amounts of copper, iron, and nickel in addition to the main components of oxalic acid, etc. This section introduces an example of measurement and quantification of oxalic acid by neutralization titration.



2. Reagents and Electrodes

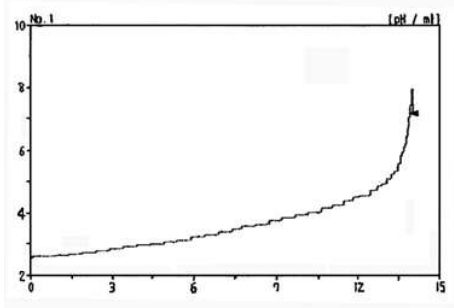
(1) Reagents	Titrant	0.01mol/L NaOH titrant
(2) Electrodes	Indicator electrode	*Glass electrode GE-101B to IE jack
*standard accessories	Reference electrode	*Reference electrode RE-201 to RE jack

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

Master File No.1 Condition file: 1	
Method	AUTO
Amp No.	1
Buret No.	1
Meas Unit	pH
S-Timer	10 sec
CP	0 mL
DP	0 mL
End Sens	500
Over mL	0 mL
Max Vol	20 mL
Mode No.	4
Unit	g/L
Blank	0
Factor	Titer of the titrant
Molarity	0.01
K	63.035
Formula	(D-B)×F×K×M/S

Mode No.4	
Pre Int	0 sec
Del K	9
Del Sens	0 mV
Int Time	3 sec
Int Sens	3 mV
Brst Speed	2
Pulse	40

4. Measurement example



Measurement results on oxalic acid

Sample No.	Sample volume (mL)	Titration value (mL)	Concentration (%)
1	10.0	13.976	0.8863
2	10.0	13.949	0.8845
3	10.0	13.861	0.8790
4	10.0	13.862	0.8790
Avg.			0.8822 %
Std. Dev.			0.0038 %
C.V.			0.43 %

5. Outline

(1) Effect of interfering components

In this measurement, oxalic acid was measured by neutralization titration. Since Fe^{3+} which is an interfering component forms a complex salt with oxalic acid, it does not affect the measurement on oxalic acid. In addition, Cu and Ni are not titrated at pH of 7 and below and do not affect the measurement on oxalic acid.

(2) Titration method other than neutralization titration

Since oxalic acid reacts quantitatively with KMnO_4 as an reducing agent, oxidation-reduction method with KMnO_4 is generally used. However, caution is required since titration may be interfered if there are compounds that are oxidized by KMnO_4 in the sample. In addition, it needs to be titrated by heating to 60 – 70°C since the reaction between oxalic acid and KMnO_4 is slow under room temperature.

Key words

Oxalic acid, neutralization titration, lead frame

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