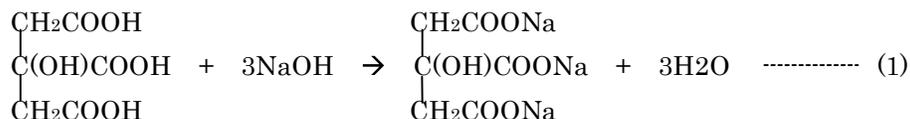


AQUACOUNTER Application Sheet	COM series	DATA No. K3	1st edition
Organic Acid		Quantification of citric acid	

1. Measurement outline

Citric acid is an oxycarbonic acid that has a carboxyl group (-COOH) and an alcoholic hydroxyl group (-OH), and it dissolves in water and is acidic. Citric acid is manufactured as a raw material for organic synthesis chemistry and as a food additive. The method for quantifying citric acid is stipulated in JIS K 8283, and it is quantified by neutralization titration using phenolphthalein indicator.

This section introduces an example of measuring low-concentration (10ppm) to high-concentration (10%) samples of citric acid solution by potentiometric titration with sodium hydroxide titrant.



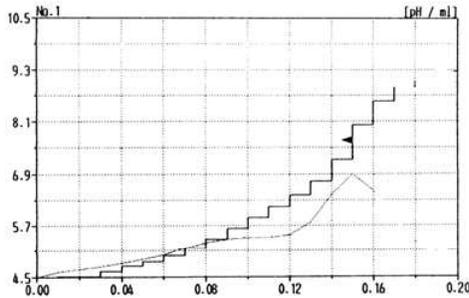
2. Reagents and Electrodes

(1) Reagents	Titrant	0.1mol/L sodium hydroxide titrant
(2) Electrodes *standard accessories	Indicator electrode	*Glass electrode GE-101B to IE jack
	Reference electrode	*Reference electrode RE-201 to RE jack

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

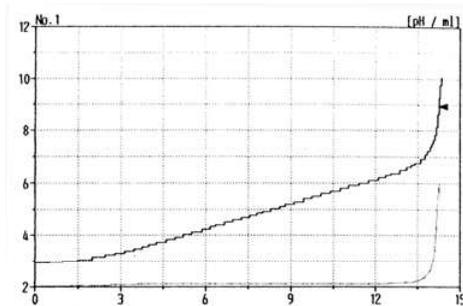
(1) Method	Auto		
(2) End Sens	1000(10%)、 5000(10ppm)		
(3) Mode	21/22	Citric acid concentration	10% 10ppm
	Pre Int		0 0
	Del K		9 2
	Del Sens		0 0
	Int Time		3 2
	Int Sens		3 3
	Brt Speed		2 2
	Pulse		40 8

4. Measurement example



Measurement results on approximately 10ppm citric acid

Sample No.	Sample volume (mL)	Titration value (mL)	Concentration (ppm)
1	100	0.145	9.6026
2	100	0.145	9.6026
3	100	0.147	9.7434
Avg.			9.6496 ppm
Std. Dev.			0.082 ppm
C.V.			0.85 %



Measurement results on approximately 10% citric

Sample No.	Sample volume (mL)	Titration value (mL)	Concentration (%)
1	1	14.224	10.0368
2	1	14.212	10.0283
3	1	14.233	10.0431
Avg.			10.0361 %
Std. Dev.			0.0074 %
C.V.			0.074 %

5. Outline

Effect of sample concentration on titration curve

100mL 10ppm sample solution and 1mL 10% sample solution were collected to conduct titration with NaOH titrant. As shown in the titration curves, the potential change near the end point is clearly smaller for the 10ppm sample, making the end point ambiguous. In such cases, favorable results can be obtained by setting the titration condition in which the volume of one dropping is fixed (0.01mL).

Key words

Quantification of citric acid, neutralization titration

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