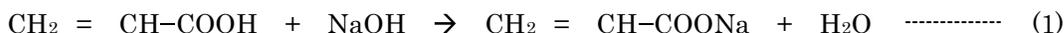


AQUACOUNTER Application Sheet	COM series	DATA No. K1	1st edition
Organic Acid		Measurement of acrylic acid purity	

1. Measurement outline

Acrylic acid is produced in mass quantity for industrial purposes as the raw material of acrylic resin. Acrylic resin has good strength and excellent transparency, and is used in windshield for aircrafts and automobiles. Acrylic resin is formed as a methyl ester polymer via methacrylic acid after forming acrylic acid from the primary raw material of ethylene.

Acrylic acid is called an unsaturated fatty acid (containing double bonds) among various carboxylic acids (containing carboxyl group –COOH), and it dissolves in water and is acidic as are formic acid and acetic acid which are saturated fatty acids. This section introduces an example in which the sample was weighed and collected precisely for potentiometric titration with sodium hydroxide titrant.



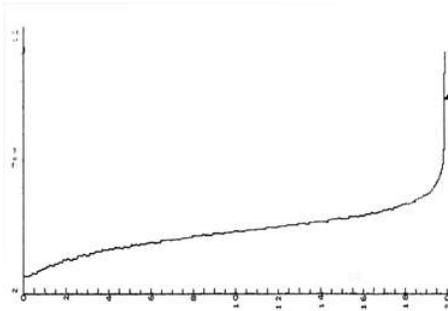
2. Reagents and Electrodes

(1) Reagents	Titrant	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
(3) Mode	5
Pre Int	0
Del K	9
Del Sens	0
Int Time	3
Int Sens	3
Brt Speed	2
Pulse	40

4. Measurement example



Measurement results on acrylic acid purity

Sample No.	Sample volume (g)	Titration value (mL)	Concentration (%)
1	1.2110	16.238	97.486
2	1.5590	20.930	97.606
3	1.4780	19.990	97.838
Avg. (Average value)			97.643 %
Std. Dev. (Standard deviation)			0.18 %
C.V. (Coefficient of variation)			0.18 %

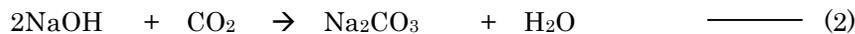
5. Outline

About control of the titrant

A high-concentration sodium hydroxide titrant is used as the titrant for this measurement.

Since sodium hydroxide tends to absorb carbon dioxide gas in air (Formula 2), it is important that the carbon dioxide gas absorbent (soda lime) in the reagent bottle be replaced regularly.

Titrant that has absorbed carbon dioxide gas contains sodium carbonate and delivers a titration curve that shows inflection points at around pH 4 and pH9.5 (Formulae 3 and 4).



Key words

Measurement of acrylic acid purity, neutralization titration

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