

Sheet No.

GT200-FO006 Food & Beverage

## Total Acid ( Free Acid ) Analysis of Sake 1/3

Method : Neutralization titration  
 Apparatus : Automatic Titrator GT-200  
 Electrode : Micro titration Combined glass electrode    Micro titration Combined Related glass electrode inner solution: 3.3 mol/L potassium chloride    solution  
 Titration mode : SET-P, Detection: pH  
 Related standard : Official Analysis Method of the National Tax Administration Agency Sake, Total Acid (Free Acid), standard Method by pH Meter

\*This sheet is provided as information. It is not to guarantee the analysis values. Please use under the ideal conditions considering external factors including the analysis environment and properties of the sample.

### Outline

Standards of sake are stipulated by the Item "Sake" of the Official Analysis Method of the National Tax Administration Agency. Total acid (content of succinic acid, malic acid, lactic acid, etc.) is as an indicator of sweetness/dryness or full/medium/light body of sake, used as one of important control items in the manufacturing process.

### Reagents

[ Titrant ] ■0.1 mol/L sodium hydroxide solution (for volumetric analysis)

### Analytical Procedure

- (1) Place 10 ml of sample solution into a 10-ml beaker using a volumetric pipette.
- (2) Titrate using 0.1 mol/L sodium hydroxide solution. (MODE: SET-P, END1: 7.2 pH)

[ Equation ]

$$\text{Total acid (free acid) (\%)} = A1 \times f$$

A1 : Titer of 0.1 mol/L sodium hydroxide solution in the main titration (ml)

f : Factor of 0.1 mol/L sodium hydroxide solution

**(Reference) Equation for deriving as succinic acid      Succinic acid ( g/100 ml ) = Acidity × 0.059**

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### Other Requirements

- Carry out pH calibration using pH reference solutions prior to measurement.
- Handle measurement reagents with care after reading through and understanding their labels and safety data sheets.
- Wear personal protective equipment such as protective goggles and gloves when handling the reagents.

### Measurement Results

Sake

	Sample amount (ml)	Titer (ml)	Measurement value (%)
1	10	1.1234	1.1
2		1.1220	1.1
3		1.1251	1.1

Number of data	(n)	3
Average		1.1
Standard deviation	(SD)	0.0016
Relative standard deviation	(RSD%)	0.1382

Total acid (free acid) of sake was measured. The result of measuring this sample with GT-200 was 1.1%. Relative standard deviation (RSD%) was 0.14%, exhibiting measurement with relatively high reproducibility.

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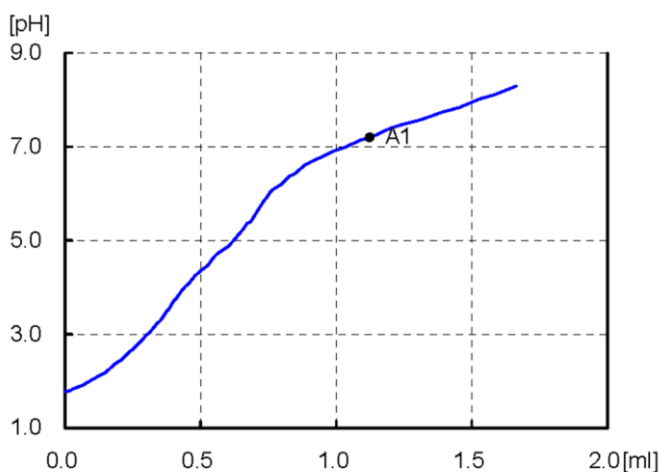
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ID No.: 2 GT No.1

User: GT-200

Measurement date : 2013/02/13 16:02  
 Sample name : Sake

Measurement type : Sample Titr  
 Sample size (S) : 10 [ml]



C1: 1.12 []

A1: 1.1234 [ml] 7.2 [pH]

Pi : 1.777 [pH]  
 Start : 0 [ml] 1.777 [pH]  
 End : 1.663 [ml] 8.291 [pH] Time: 3' 33"

Run File No.: 0 Quick Mode

Titration File No.: 19 Total acid (free acid) measurement of sake

Mode : SET-P End1: 7.2 [pH]

Detect : pH

BRT No. : 1

Reagent : 2

WTint : 60 [sec]

Vup : 300 [μl]

Vlow : 10 [μl]

dE : 0.1 [pH]

dT : 3 [sec]

Vmax : 50 [ml]

Vover : 0.5 [ml]

C1: A1\*f

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Reag : 0.1M NaOH E : 1 M : 0.1 [Mol/l]  
 f : 1.001

Buret Injection Speed: 250 [ul/sec]