

Sheet No.

GT200-FO004E Food & Beverage

Determination of salt content in Worcester Sauce — 1/3

Method	: Precipitation Titration
Apparatus	: Automatic Titrator model GT-200(GT0EF) Electrodes: Glass electrode (GTPH1B) Reference electrode, DJ (GTRE10) Inner solution: 1mol / L Potassium chloride Outer solution: 1mol / L Potassium nitrate
Titration mode	: INF/SP, Detection: pH
Related standard	: Japanese Agricultural Standards JAS for Worcester Sauce, Testing method of unsalted soluble solid and salt by potentiometric titration

*This application sheet is provided as reference, and does not assure the measurement results. Please consider analysis environment, external factors and sample nature for optimal conditions before the measurement.

Outline

In Japan, specification of Worcester Sauce is specified by Japan Agricultural Standard. Salt in both superfine and standard grade must be less than 11%.

Reagents

[Titrant]

■ 0.1mol/L-silver nitrate solution (Volumetric analysis grade)

[Reagents]

■ Polyoxyethylene (20) Sorbitan Monolaurate solution Take 1g of polyoxyethylene (20) Sorbitan Monolaurate into a 200ml beaker and add 100ml of water.

■ Nitric acid (1+1): Mix same amount of pure water and nitric acid.

Analytical Procedure

- (1) Take 100ml of pure water accurately into a 100ml by whole pipette.
- (2) Add 1ml of nitric acid (1+1) into the beaker.
- (3) Add 1ml of Polyoxyethylene (20) Sorbitan Monolaurate solution.
- (4) Add pure water for excessing the solution volume for dipping the electrodes.

[Calculation]

Acidity = $A1 \times f$

A1 : Titration volume of 0.1mol/L-sodium hydroxide solution from sample test (ml)

f : Factor of 0.1mol/L-potassium hydroxide / ethanol titrant

For reference: determination as tartaric acid Tartaric acid(g/100ml) = Acidity \times 0.075

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GT200-FO004E Determination of salt content in Worcester Sauce 2/3**Other Requirements**

- Before the testing, pH calibration is required.
- Make sure to confirm labels and safety data sheets of reagents and gases used for the measurement and handle them with enough care.
- Wear protective equipment (eye protector, gloves and others) when handling reagents.

Measurement Results

Worcester Sauce

	Sample size (ml)	Titration volume (ml)	Acidity
1	0.4241	6.3229	8.7
2	0.4080	6.0751	8.7
3	0.4105	6.1107	8.7

Nos. of data (n) 3
Average 8.7
Standard deviation (SD) 0.0072
Relative S.D. (RSD%) 0.0825
Blank 0.0000ml

Salt in Worcester Sauce was tested. Result measured by GT-200 was 8.7%.
Repeatability was good with relative standard deviation (RSD%) 0.08%.

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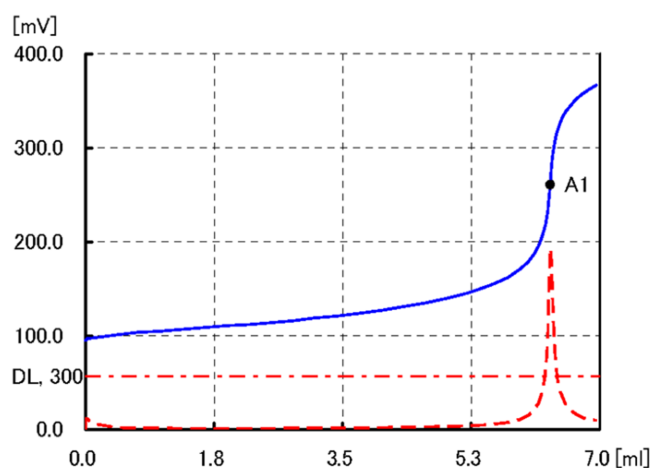
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ID No. : 1 GT No.1

User : GT-200

Measurement : 2013/04/18 9:38
Sample name : Worcester Sauce

Type : Sample Titr
Sample size(S) : 0.4241 [g]



C1 : 8.70 [%]

A1 : 6.3229 [ml] 261 [mV]

Initial potential: 95 [mV]

Start (t) : 0 [ml] 95 [mV]

End (End) : 6.952 [ml] 367 [mV]

Measurement time (Time) : 3'48"

Run file No. : 9 Salt in Worcester Sauce

Titration No. : 29 Salt in Worcester SAuce

Mode : INF End1, End1 Width : 350 [mV] ± 500 [mV]

Detect : mV1

BRT No. : 1

Reagent : 5

WTint : 0 [sec]

Vup : 300 [μl]

Vlow : 10 [μl]

dE : 2 [mV]

dT : 3 [sec]

DL : 300 [mV/ml]

DetCnt : 6

Vmax : 20 [ml]

Vover : 0.5 [ml]

C1 : $((A1-BL)/K1)*M*f*FW*(1/S)*100$

[%]

Reagent (Reag) : 0.1M AgNO3

Factor (f) : 0.999

Formula weight (FW) : 58.44

Equivalent (E) : 1

Blank (BL) : 0 [ml]

Molarity (M) : 0.1 [Mol/l]

Coefficient1(K1) : 1000

Buret Injection Speed : 500 [ul/sec]