

Sheet No.

GT200-OF031E Oil

Determination of peroxide number of palm oil

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Method	: Oxidation-reduction titration
Apparatus	: Automatic Titrator model GT-200(GT0EF) Electrodes: Combined platinum electrode(GTPR1B) *Inner solution: 3.3mol/l Potassium chloride
Titration mode	: INF, Detection: mV
Related standard	: 1) Japan Agricultural Standards “Japanese Agricultural Standards for Edible Vegetable Oils and Fats,” “14. Peroxide Numbers” 2) Japan Oil Chemists’ Society “JOCS Standard Methods for the Analysis of Fats, Oils and Related Materials,” “Peroxide Numbers (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

Palm oil is a vegetable oil obtained from the fruit of an oil palm. In addition to the use as cooking oil, it is used as raw materials for soap, detergent and biodiesel. Peroxide numbers are measured using the property that peroxide generated by oxidization of oil releases iodine by reacting with potassium iodide.

Reagents

[Titrant]

■ 0.01mol/L-sodium thiosulfate in water (Volumetric analysis grade)

[Adjustment reagents]

■ Titration solvent ... Isooctane: Acetic acid (3:2)

■ Saturated potassium iodide solution in water ... Saturate potassium iodide (JISK8913) in pure water. Leave the crystals in the solution. Do not use a colored one. The degree of solubility of potassium iodide (at 20 degrees C) is 144g per 100g of water.

Analytical Procedure

[Pretreatment]

As palm oil is solid at room temperature, melt it down in a water bath before the determination.

[Measurement]

- (1) Add 5g melted sample into a 200ml beaker.
- (2) Collect 60ml titration solvent using a measuring cylinder and add it into the above-mentioned beaker.
- (3) After the sample is melted, collect 1ml saturated potassium iodide solution and add it into the beaker.
- (4) After spraying nitrogen gas onto the surface of the sample solution in the beaker for about 10 seconds, immediately close the lid and leave it still in a dark place for 5 minutes.
- (5) After leaving it still for 5 minutes, add 60ml pure water using a measuring cylinder and titrate with 0.01mol/L-sodium thiosulfate solution while agitating strongly.

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[Calculation]

$$\text{Peroxide (meq/kg)} = A1 \times f/S \times 10$$

A1 : Titration volume of 0.01mol/L-sodium thiosulfate solution at sample titration (ml)

f : Factor of 0.01mol/L-sodium thiosulfate solution

S : Sample volume (g)

 10 : 0.01mol/L (Molar concentration of sodium thiosulfate) . 1,000.
 (Converted into the value per 1kg of sample)

Other Requirements

- 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

	Sample size (g)	Titration volume (ml)	Results (%)
1	5.0118	2.3578	4.70
2	5.0135	2.2954	4.58
3	5.0027	2.3159	4.63

Nos. of data	(n)	3
Average		4.64
Standard deviation	(SD)	0.06
Relative standard deviation	(RSD%)	1.37

Peroxide numbers of palm oil were measured using GT-200. The average of three measurements was 4.6mg KOH/g.

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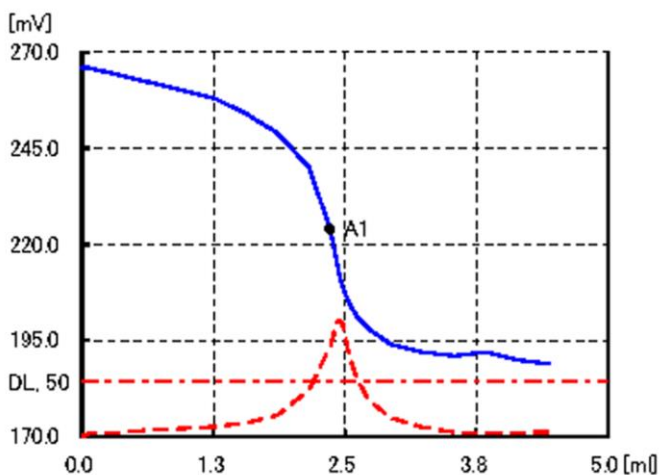
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ID No. : 3 GT No.1

User : GT-200

Measurement : 2015/01/23 10:48
 Sample name : Palm oil

Type : Sample Titr
 Sample size(S) : 5.0118 [g]



C1 : 4.70 [meq/Kg]

A1 : 2.3578 [ml] 224 [mV]

Initial potential (Pi) : 266 [mV]

Start	: 0	[ml]	266	[mV]	
End	: 4.44	[ml]	189	[mV]	Time : 1'36"

Run file No. No. : 4 Palm oil

Titration file No. : 47 Peroxide number

*Run file and Titration file parameters are set for each analysis item

Mode : INF End1, End1 Width : 250 [mV] ± 500 [mV]

Detect : mV1

BRT No. : 1

Reagent : 31

WTint : 10 [sec]

Vup : 300 [μl]

Vlow : 20 [μl]

dE : 2 [mV]

dT : 3 [sec]

DL : 50 [mV/ml]

DetCnt : 8

Vmax : 50 [ml] C1 : A1*f/S*10

Vover : 0.5 [ml] [meq/Kg]

Reagent name (Reag) : Na2S2O3

Equivalent (E) : 1

Molarity (M) : 0.01 [Mol/l]

Factor (f) : 1

Buret Injection Speed : 500 [ul/sec]