

Food

Acidity of Red wine

Automatic Potentiometric Titrator  
Acid-base titration

Standard

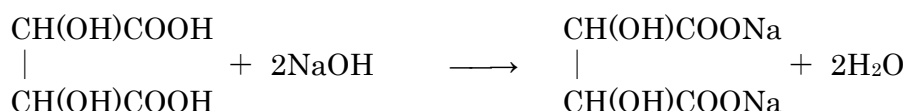
Analytical method specified by  
National Tax Administration  
Agency

## 1. Abstract

National Tax Administration Agency (Fruit wine) specifies neutralization titration with sodium hydroxide.

Potentiometrically titrate a wine sample with 0.1ml/L sodium hydroxide up to pH8.2 and convert the titration volume to tartaric acid.

When a sample wine contains carbon dioxide gas, first degas it by boiling.



## 2. Reference

- 1) Analytical method prescribed by National Tax Administration Agency (Instruction No. 6, revised in 2007)

## 3. Cautions in measurement

- 1) Obtain the factor in advance of 0.1ml/L sodium hydroxide reagent for measurement of acidity using amide sulfate according to JIS K8001 General Principle of Test Method and ISO 6531-1.
- 2) Keep 0.1ml/L sodium hydroxide reagent in zeolite poly-container to prevent ambient carbon dioxide from permeation.
- 3) Use pure water for dilution without carbon dioxide gas dissolved in it.
- 4) If the sample contains particles like grape pulp, it may cause measurement error. Filter such sample in advance.

## 4. Post-measurement care

After the electrode is rinsed with pure water, keep its tip dipped in a beaker filled with pure water in order to avoid it from drying up.

## 5. Test equipment

Main unit : Automatic potentiometric titrator (Standard preamplifier: STD)  
Electrode : Combination glass electrode  
Temperature compensation electrode

## 6. Reagent

Reagent : 0.1mol/L sodium hydroxide (f=1.0147)

## 7. Measurement procedure

—Measurement—

- 1) Deliver 10mL sample into a 200mL beaker.
- 2) Add pure water to make it total 125mL.
- 3) Titrate with 0.1mol/L sodium hydroxide to obtain acidity.

## 8. Formula

Acidity ( Tartaric acid g/100mL ) = ( EP1 - BL1 ) × TF1 × C1 × K1 / S

- EP1 : Titration volume ( mL )  
BL1 : Blank level ( 0.0mL )  
TF1 : Reagent factor (1.0147)  
C1 : Concentration conversion coefficient ( 7.5 mg/mL )  
(Tartaric acid (mg) equivalent to 1mL of 0.1mol/L NaOH)  
K1 : Unit conversion coefficient ( 0.01 )  
S : Sample size (mL)

## 9. Example of measurement

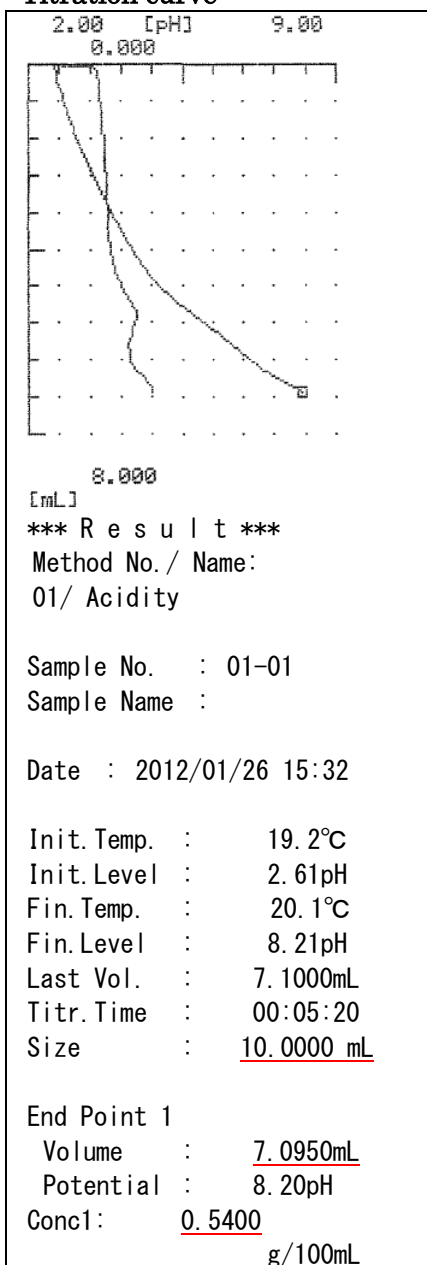
— Ambient condition —

Room temperature : 20.0 °C	Humidity : 57 %	Weather : Cloudy
----------------------------	-----------------	------------------

### -Titration parameter-

Model : AT-700	[Blank List]
Method No./Name : 01/Acidity	BL1 : 0.0000
[Titration]	[Factor List]
Titration Mode : Auto Inter.	TF1 : 1.01470
Titration Form : Level	
Blank Mode : Off	
Burette No. : 01	
Ch./Unit : Ch1/pH	
Direction : Auto	
Max Vol. : 20.0000mL	
Wait Time : 0s	
Dose Mode : None	
[Control]	
Number of EP : 1	
1st End Level : 8.2	
Gain : 1	
Ctl. Speed : Medium	
Stir. Speed : 4	
[Calculation]	
Calc. Type : Sample	
CO1 : Set	
Formula (EP1-BL1)*TF1*C1*K1/S	
Unit : %	
EP No. : 1	
Temp. Comp. : Off	
[Constant]	
C1 : 7.5	
K1 : 0.01	

### -Titration curve-



(The above parameters and titration curve are printed out by AT-700)

<p>«Titration parameter»</p> <p>Titration Mode: <a href="#">titration mode</a> / Titration Form: <a href="#">titration form</a> / Blank Mode: <a href="#">Blank mode</a> / Burette No.: <a href="#">number of burette</a> / Ch./Unit: <a href="#">selection of detector number and potential unit for detection</a> / Direction: <a href="#">of titration</a> Max Vol.: <a href="#">Max Volume of titration</a> / Wait Time: <a href="#">before titration starts</a> / Dose Mode: <a href="#">the way of fixed dose</a></p> <p>«Control parameter»</p> <p>Number of EP: <a href="#">the number of endpoints</a> / 1st End Level: <a href="#">potential of the first EP</a> / Gain: <a href="#">sensitivity of signal</a> / Ctl. speed: <a href="#">Control speed</a> / Stir. speed: <a href="#">Stirrer speed</a></p> <p>«Calculation parameter»</p> <p>Calc. type: <a href="#">calculation type</a> / CO1: <a href="#">concentration formula 1</a> / Formula: <a href="#">Formula</a> / Unit: <a href="#">of calculated results</a> / EP No.: <a href="#">EP position to carry out computation</a> / Temp. Comp.: <a href="#">temperature compensation</a></p> <p>«Constant parameter»</p> <p>C1(mg/mL): <a href="#">concentration conversion coefficient</a> / K1: <a href="#">unit conversion coefficient</a> / Blank1: <a href="#">blank level</a> / TF1: <a href="#">factor of reagent</a></p>
---

–Measurement results–

n	Sample (mL)	Titration (mL)	Acidity (g/100mL)
1	<u>10.00</u>	<u>7.0950</u>	<u>0.5400</u>
2	10.00	7.0950	0.5400
3	10.00	7.0861	0.5393

Statistics		
Mean	0.5398	g/100mL
SD	0.0004	g/100mL
RSD	0.0741	%

\* The above results were obtained by 3 tests of the same sample.

\* Red underline shows the data from page 3/4.

## 10. Summary

Acidity is one of important measurement items in quality control and evaluation of wine along with alcohol degree.

In this measurement, good repeatability was obtained with a relative standard deviation of 0.1% or less.

Stable measurement is possible by using automatic potentiometric titrator.