Determination of total titratable acidity in wine and most (EU – version)

Description

This method is used for the quantitative determination of total acidity in wine and most. The total acidity is calculated as g/L tartaric acid. In the EU, other European countries, Israel and RSA the pH endpoint 7.0 is used. In oversees countries such as Australia and the USA pH 8.2 or equivalence point is used.

Instruments

Titrator	TL 5000, TL 7000 or higher
Exchange Unit	WA 20, 20 ml dosing unit for TL 5000
Electrode	N 62, A 7780 NTC30 DIN N, A 162 2M-DIN-ID or similar
Cable	L1A (only for electrodes with plug head)
Stirrer	Magnetic stirrer TM 235 for TL 7XXX, TM 50 for TL 5000
Lab accessory	Glass beaker 50 ml
	Magnetic stirrer bar 30 mm

Reagents

1	Sodium hydroxide solution 0.1 mol/l
2	DIN-NIST buffer pH 4.01 or technical buffer 4.00
3	DIN-NIST buffer pH 6.87 or technical buffer 7.00
4	KCl solution 3 mol/l
5	Soda lime
All reagents should be of analytical grade or better.	

Titration procedure

Reagents

The titer determination of the NaOH 0.1 mol/l is carried out as described in the application report "Titer determination of strong bases". The sodium hydroxide must be protected with a CO_2 absorption tube filled with Soda lime.

Cleaning of the electrode

The electrode is cleaned with distilled water. Suitable for storage is KCl solution 3 mol/l or electrolyte solution L 911.

Because this titration is mainly done as an endpoint titration, the electrode must be calibrated periodically (at least weekly). We recommend a 2-point calibration with the technical buffers 4.00/700 or DIN-NIST buffers pH 4.01 and 6.87.

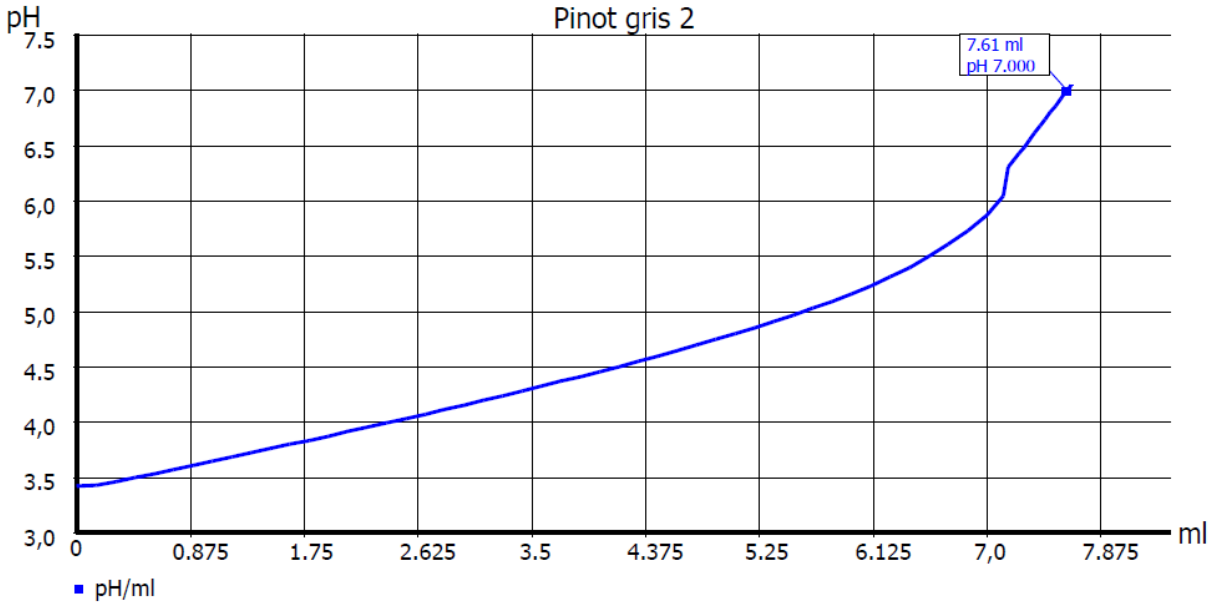
Sample preparation

10 ml CO_2 free wine or most sample are pipetted in a 50 ml beaker and diluted with 10 ml CO_2 free water. A magnetic stirrer bar is added and the sample is titrated with Sodium hydroxide 0.1 mol/l under effective stirring to the endpoint pH 7.0

If the pH value should be measured before it is also possible to use 20-25 ml sample volume and/or change the NaOH concentration from 0.1 to 0.25 or 0.33 mol/l. In this case the sample is not diluted with water.

Titration parameter

Sample titration



Default method	Total acidity (7.0)		
Method type	Automatic titration		
Modus	Endpoint		
Measured value	pH		
Measuring speed / drift	normal	Minimum holding time	2 s
		Maximum holding time	15 s
		Measuring time	2 s
		Drift	20 mV/min
Initial waiting time	0 s (including pH reading > 10 seconds)		
Step size	0.04 ml		
Dampening	none	Titration direction	increase
Pretitration	Off	Delay time	0 s
Endpoint 1	7.0 pH	Delta Endpoint	1.0 pH
		Endpoint delay	5 s
Endpoint 2	Off		
Max. titration volume	20 ml		
Dosing speed	30 % (TL 7000 and higher)/ 50 % for TL 5000	Filling speed	30 s

Calculation:

Formula 1

$$TA\ [g/l] = \frac{(EP1 - B) * T * M * F1}{V * F2}$$

EP1		Consumption of titrant at the end point
B	0	Blank value
T		Actual concentration of the titrant
M	150.09	Molecular weight of tartaric acid
V		Volume of the sample (e.g. 10) in ml
F1	1	Conversion factor
F2	2	Conversion factor (stoichiometric factor, tartaric acid is a two-basic acid)

The molecular weight of tartaric acid is 150.09. It is a so called two basic acid. So the value needs to be divided by 2 (F = 2). It is of course possible to enter already the calculated equivalent weight such as 150.09/2 = 75.045 in M. In this case F2 = 1.

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