Determination of SO_2 in wine

Description

Determination of free and total SO_2 in wine without distillation by biamperometric titration with Iodine.
This application is suitable for wine. Other samples like fruit juices may produce too high results, depending on the composition. Free SO_2 is present as SO_2, SO_3^{2-}, HSO_3^- or H_2SO_3. Bound SO_2 is bound strongly to reactive compounds of the wine like aldehydes, it can be hydrolyzed with NaOH. The total SO_2 is the sum of free and bound SO_2.
The reference method for SO_2 determination is a distillation method.
The result is calculated as mg_{SO2}/l.

Instruments

Titrator	TL 7000 or higher
Electrode	Pt 1200 or Pt 1400 or similar
Cable	L 1 NN
Stirrer	Magnetic stirrer TM 235 or similar
Lab accessory	glass beaker 100 ml
	Magnetic stirrer bar 30 mm

Reagents

1	Iodine solution 0.01 or 0.025 mol/l or N/128.
2	Potasium iodide 5%
3	Sulfuric acid 25%
4	Sodium hydroxide 2 mol/l
6	Distilled water
All reagents should be of analytical grade or better.	

Titration procedure

Reagents

Iodine solution 0.01 mol/l
It is recommended to use a ready-to-use 0.1 mol/l solution.
The titer determination is done as described in the application note “Titer Iodine”.

KI solution 5%
5g of KI are placed in a 100ml volumetric bottle, dissolved in distilled water and made up to 100 ml.

Cleaning of the electrode

The electrode is rinsed with water. The electrode is stored clean and dry.

Sample preparation

1. Free SO_2

25 ml of the sample are placed in a beaker, 10 ml H_2SO_4 25% and 10 ml KI solution 5% are added. The solution is titrated immediately with Iodine solution. A (too) long waiting time between the addition of H_2SO_4 and KI can cause wrong results due to a loss of the SO_2.

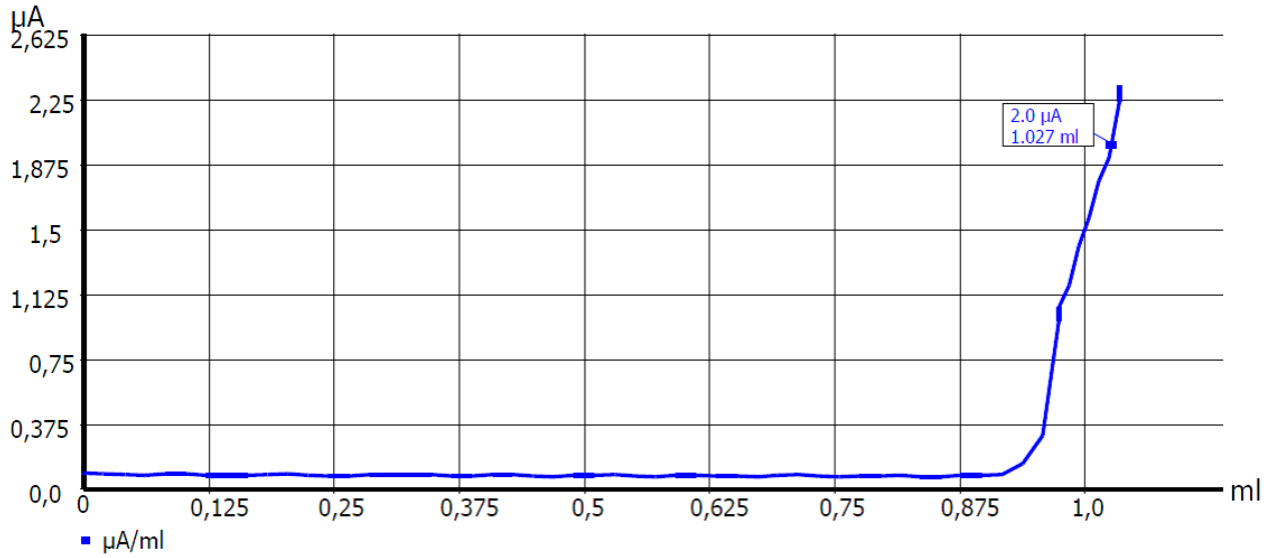
2. Total SO_2

25 ml of the sample are placed in a beaker, 10 ml of NaOH 2 mol/l are added and mixed with the sample to hydrolyze the bound SO_2. Then, the mixture is allowed to react for 5 minutes without stirring. After this, 10 ml H_2SO_4 25% and 10 ml KI solution 5% are added. The solution is titrated immediately with Iodine solution. A (too) long waiting time between the addition of H_2SO_4 / KI can cause wrong results due to a loss of the SO_2.

For a higher accuracy of the titration it can be usefull to a double-hydrolysis to get all bound SO_2 in the Sample: to the ready-titrated solution from the first hydrolysis 10 ml of NaOH 2 mol/l are added and mixed with the sample. Then, the mixture is allowed to react for 5 minutes without stirring. After this, 10 ml H_2SO_4 25% are added. The solution is titrated immediately with Iodine solution. The sum of the consumption of the first and the second titration is used for the calculation of total SO_2.

Titration parameter

Sample titration



Default method	SO2 in wine		
Method type	Automatic titration		
Modus	d-stop		
Measured value	µA		
Measuring speed / drift	User defined	Fixed delay time	1 s
Initial waiting time	0 s	Polarization voltage	100 mV
Linear Steps	0.04 ml		
Damping	strong	Titration direction	increase
Pretitration	off	Delay time	0 s
End value	off		
Endpoint	2.0 µA	Delta Endpoint	1.0µA
Max. titration volume	15 ml	Endpoint delay	5 s
Dosing speed	100%	Filling speed	30 s

Calculation:

$$SO2\ [mg(SO2)/l] = \frac{(EP1 - B) * T * M * F1}{W * F2}$$

B	M01	Blank value, saved in global Memory M01
EP1		Consumption of titrant at first Endpoint
T	WA	concentration of the titrant (I_2)
M	64.066	Molecular mass
V	man	Volume of the sample in ml
F1	1000	Conversion factor
F2	1	Conversion factor

Any questions? Please contact the application team:

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