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Titration of Chloride in food samples according to ISO 5943

Description

The determination of the chloride content of food is done by titration with silver nitrate solution 0.1 mol/l.
This determination is not always easy, since first the chloride has to be released from the sample. Sample preparation is very important for samples such as cheese, butter or similar products to capture all the chloride. The Norm ISO 5943 requires heating up to 55 ° C to dissolve the sample. However, it has been found that heating up to the boiling point gives better results for difficult samples. The calculation is made as % chloride or % NaCl.

Instruments

Titrator	TL 5000 or higher
Electrode	AgCl 62 or AgCl 62 RG
Cable	L1A
Stirrer	Magnetic stirrer TM 235 or similar
Lab accessory	Glass beaker 150 ml
	Magnetic stirrer bar 30 mm
	Homogenizer PT1200 or similar (optional)

Reagents

1	Silver nitrate solution 0.1 mol/l
2	Nitric acid 4 mol/l
3	Polyvinylalkohol – solution 0.5% (optional)
4	Electrolyt solution L2114 (KNO_3 2 mol/l + KCl 0.001 mol/l)
5	Distilled Water
6	
All reagents should be of analytical grade or better.	

Titration procedure

Reagents

The titer determination of the $AgNO_3$ solution is carried out as described in the application report "Titer determination of $AgNO_3$".

Polyvinyl alcohol - solution 0.5%
0.5 g of polyvinyl alcohol are dissolved in 100 ml of distilled water.

Cleaning of the electrode

The electrode is rinsed with distilled water. The electrolyte solution L2114 is suitable for storage.

Sample preparation

The sample is weighed into a 150 ml beaker and made up to about 80 ml of distilled water. The mixture is heated up to boiling with vigorous stirring. If necessary, the homogenizer PT1200 can also be used for better comminution of the sample. After 10 min. the sample is allowed to cool down to room temperature and 0.5 ml 4mol / l HNO3 are added. After cooling, the titration is done with 0.1 mol/l with AgNO3 solution to an equivalence point. In order to prevent deposits of AgCl on the electrode, 0.5 - 1 ml of the polyvinyl alcohol solution can be added. The consumption should be about 5 - 15 ml.

The titration can be carried out with samples with chloride contents of a few ppm - 100%, but the amount of sample has to be adjusted.

Chloride content [%]	Sample [g]
< 0.1	> 10
0.1 – 1	1 – 10
1 – 10	0.1 – 0.2
10 – 50	0.05 – 0.1
50 - 100	0.05

Titration parameter

Sample titration
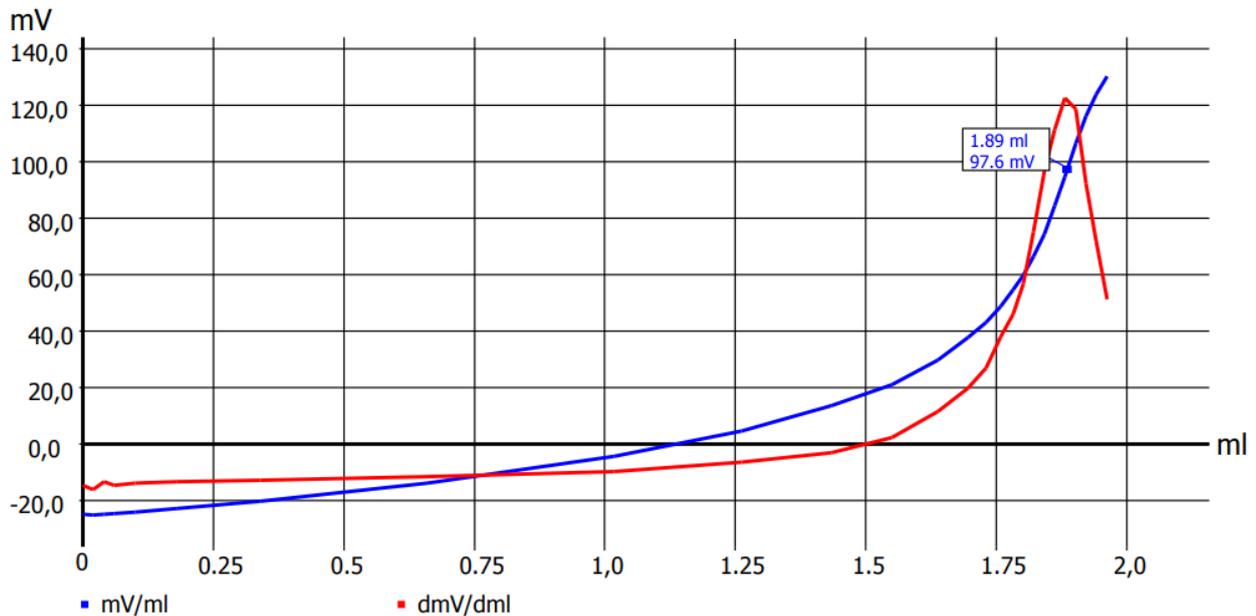
Default method	Chloride %				
Method type	Automatic titration				
Modus	Dynamic				
Measured value	mV				
Measuring speed / drift	User defined	Minimum holding time	3 s		
		Maximum holding time	15 s		
		Measuring time	3 s		
		Drift	10 mV/min		
Initial waiting time	0 s				
Dynamic	steep	Max step size	1.0 ml		
		Slope max ml	15		
		Min. step size	0.02 ml		
		Slope min. ml	230		
Damping	none	Titration direction	increase		
Pretitration	off	Delay time	0 s		
End value	off				
EQ	On (1)	Slope value	400		
Max. titration volume	50 ml				
Dosing speed	100%	Filling speed	30 s		

For some samples it may happen that the titration curve is very flat and the titrator does not stop the titration at the EQ. In this case, the slope value for the EQ should be reduced to 200.

Calculation:

$$Result \; [\%] = \frac{(B - EQ1) * T * M * F1}{W * F2}$$

B	0	Blank value
EQ1		Consumption of titrant at first Equivalence point
T	WA	Actual concentration of the titrant
M	35.45	Molecular weight
W	man	sample weight in g
F1	0.1	Conversion factor
F2	1	Conversion factor

If the calculation value is not % chloride, but % NaCl, then M is set to the molar mass of NaCl 58.44 g/mol.

Any questions? Please contact the application team:

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