

Titration of Sodium chloride in Sauce

Description

The determination of the salt content in Ketchup, Mayonnaise, Mustard Sauce, Salat sauce 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. For this purpose, the sample is dispersed as finely as possible. Sample preparation is very important to capture all the chloride.

The result is calculated as % NaCl.

Instruments

Titrator	TL 5000, TL 7000 or higher
Electrode	AgCl 62 or AgCl 62 RG
Cable	L 1 A
Stirrer	TM 235
Homogenizer	Polytron Pt 1200
Lab accessory	Glass beaker 150 mL
	Magnetic stirrer bar 30 mm

Reagents

1	Silver nitrate solution 0.1 mol/L
2	Nitric acid 4 mol/L
3	Polyvinylalkohol – solution 0.5% (optional)
4	Electrolyte solution L2114 (KNO ₃ 2 mol/l + KCl 0.001 mol/L) for AgCl 62
5	Distilled Water
All reagents should be of analytical grade or better.	

Titration procedure

Reagents

Silver nitrate 0.1 mol/L

Silver nitrate 0.1 mol/L is available as ready to use solution.

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 about 80 mL of hot, distilled water and made up to 100 mL after cooling down.

Cleaning of the electrode

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

Calibration with buffers or comparable test solutions as with pH electrodes is not possible and not necessary!

Sample preparation

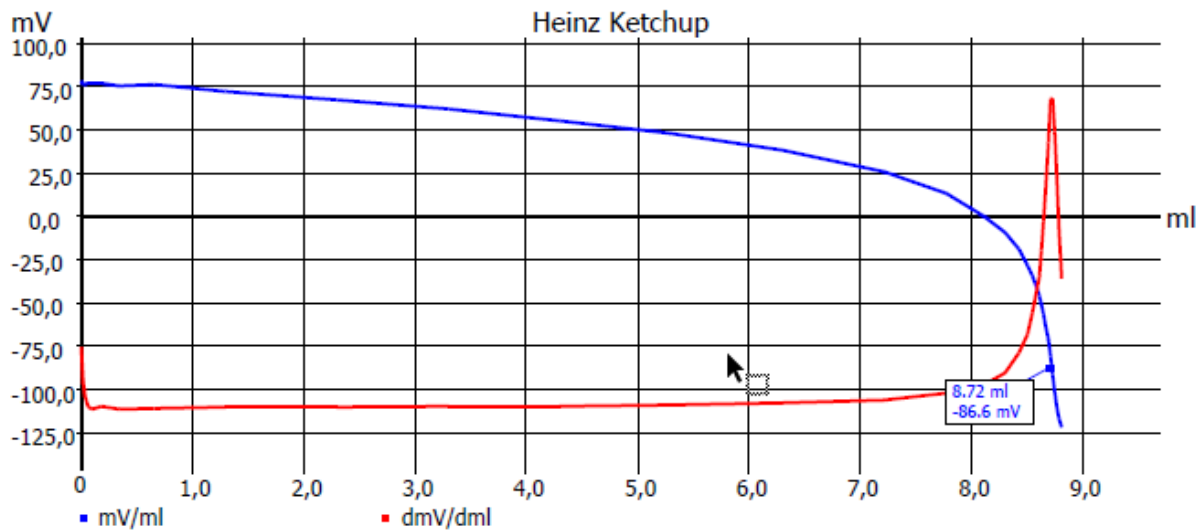
The sample is weighed into a 150 ml beaker and made up to about 80 ml of distilled water. The homogenizer Polytron Pt 1200 (or similar) is used for better comminution of the sample. 0.5 ml of 4 mol/L HNO_3 is added. The titration is done with 0.1 mol/L with AgNO_3 solution to an equivalence point. In 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 – 2.0
10 – 50	0.05 – 0.1
50 - 100	0.05

Titration parameter

Sample titration



Default method	Chloride in %		
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% (40 mL/min)	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:

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

B	0	Blank value
EQ1		Consumption of titrant at first Equivalence point
T	WA	Actual concentration of the titrant
M	58.44	Molecular weight of Sodium chloride
W	man	sample weight in g
F1	0.1	Conversion factor
F2	1	Conversion factor