Application Note AN-T-004

Chloride in meat products

Fully automated sample preparation and analysis based on ISO 1841-2

In order to maintain product quality, the sodium chloride content in meat products must be monitored, as the limit values defined by the respective public health authorities must not be exceeded. The chloride content in food correlates with the salt content; its determination is therefore described in various norms and standards. However, preparation of meat samples is time consuming, as it requires homogenization with a mixer and a chloride extraction with water.

In order to reduce workload and increase sample throughput, this Application Note describes a fully automatic potentiometric titration of chloride with silver nitrate in meat products based on ISO 1841-2, including fully automated sample preparation using a Polytron homogenizer.

SAMPLE AND SAMPLE PREPARATION

The method is demonstrated for different meat products: pork sausage «Lyoner» and chicken breast with curry crust. If necessary, the spice crust around the meat is removed and then the sample is cut into small pieces.

EXPERIMENTAL

This analysis is carried out on an automated system consisting of an OMNIS Advanced Titrator and an OMNIS Sample Robot S equipped with a dProfitrode and a dAg-Titrode. Furthermore, a Polytron homogenizer is used for sample preparation.
Water is added to a reasonable and representative amount of sample. The pH is adjusted with nitric acid to below pH 1.5. The sample is titrated with standardized silver nitrate until after the equivalence point is reached. For dip rinsing of electrodes and burets, first water, then isopropanol is used. Afterwards, the electrodes are conditioned in water for one minute before the next sample.

Figure 1. OMNIS Sample Robot S, OMNIS Dosing Module and OMNIS Advanced Titrator equipped with dProfitrode and dAg-Titrode for the determination of chloride content.

RESULTS

The analysis demonstrates acceptable results and well-defined titration curves. The results and an example titration curve are displayed in Table 1 and Figure 2, respectively.

Table 1. Mean chloride content of two meat products determined with an automated OMNIS system (n = 6).

Sample	Chloride content in mg/100 g sample	SD(rel) in %
Pork sausage «Lyoner»	1175.5	1.1
Chicken breast with curry crust	1158.1	0.8

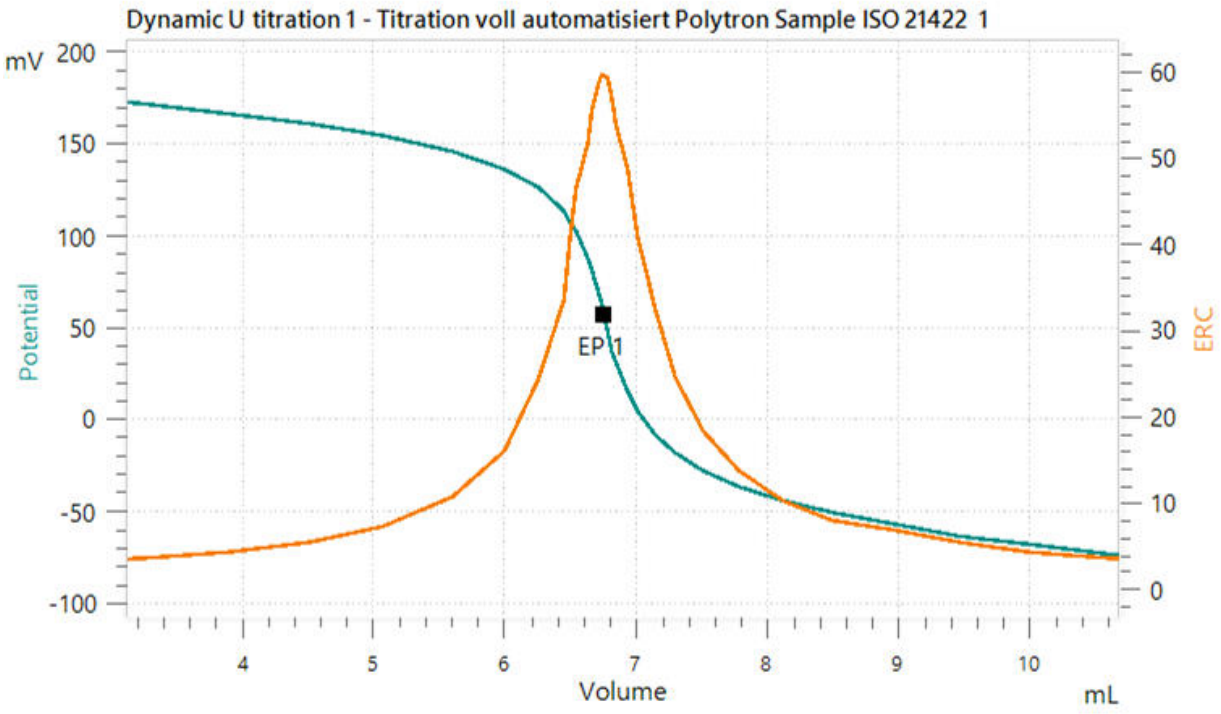

Figure 2. Example titration curve of the chloride determination of chicken breast.

CONCLUSION

Titration is a precise and reliable method to determine the chloride content in meat products according to international standards, such as ISO 1841-2. Using an OMNIS Sample Robot equipped with a Polytron homogenizer allows a fully automated sample preparation and chloride content determination of up to four samples in parallel, increasing accuracy and freeing up valuable time of the operator and thus increasing the productivity in the lab. The OMNIS system offers the opportunity to customize the system according to your needs, and expand it for other required titration applications on foodstuff.

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CONFIGURATION

OMNIS Titrator Salt

The OMNIS Titrator Salt offers you the complete package for argentometric titration. The package contains the OMNIS Advanced Titrator with magnetic stirrer, a 10 mL cylinder unit, a d-AgTitrode for titration with silver nitrate and one stand-alone OMNIS Software license.

Polytron PT 1300 D

Polytron PT 1300 D - Metrohm version

Homogenizer that can be controlled directly by OMNIS Software, tiamoTM or Touch Control.

The Polytron PT 1300 D is comprised of a control unit and a drive. The coupling system on the drive permits simple and rapid replacement of the aggregates without additional tools.

Solid samples can be pulverized without difficulty. However the instrument is also highly suitable for ensuring thorough mixing in viscous samples.