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

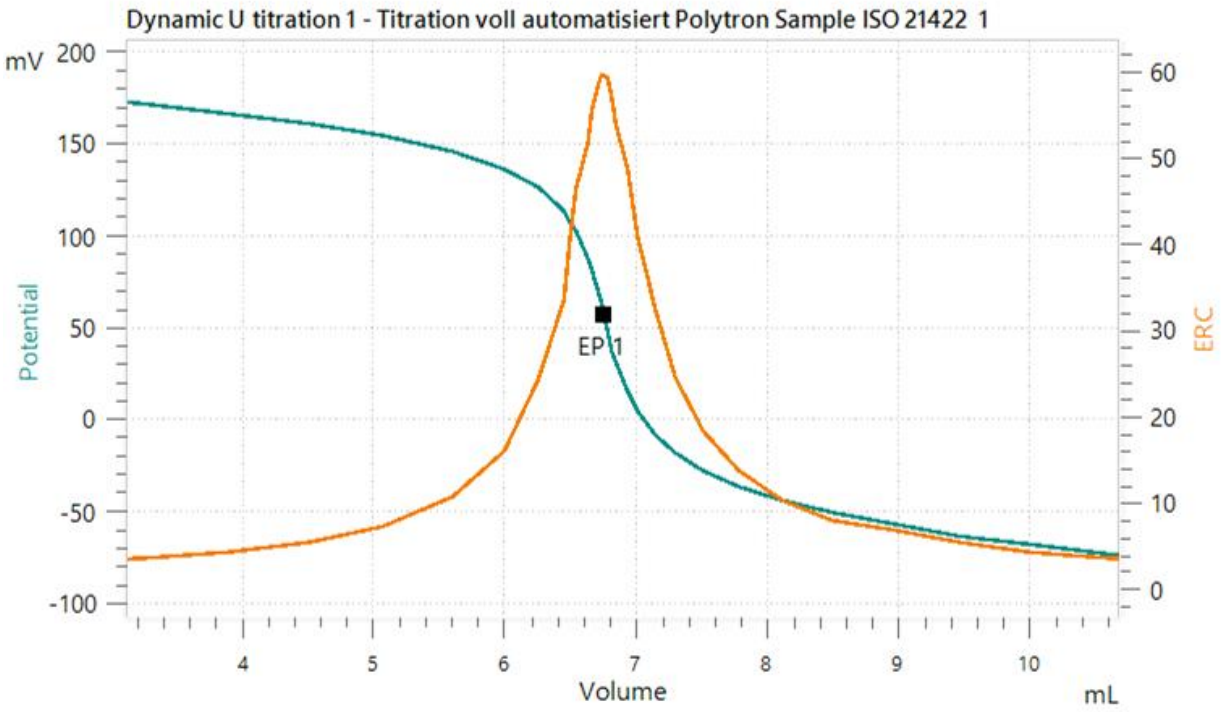

Figure 2. Example titration curve of the chloride determination of chicken breast.

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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CONTACT

メトロームジャパン株式会社
143-0006 東京都大田区平和島6-1-1
null 東京流通センター アネックス9階
metrohm.jp@metrohm.jp

CONFIGURATION

OMNIS Titrator Salt

OMNIS Titrator Salt は、銀滴定のための完璧なハッケーシを提供します。ハッケーシには、マクネチックスターラ付き OMNIS Advanced Titrator、10 mL のシリンターユニット、硝酸銀による滴定のための d-AgTitrode、および OMNIS ソフトウェアのスタントアローンライセンスか含まれています。

Polytron PT 1300 D

Polytron PT 1300 D - Metrohm ハーション OMNIS Software、tiamoTM または Touch Control による直接操作か可能なホモケナイサー。Polytron PT1300 D は制御装置と駆動システムから構成されています。駆動システムのカッフリンクシステムにより、余計なツールを使用することなくユニットを容易かつ迅速に交換することか可能てす。固体のサンフルを難なくすり潰すことかてきます。この装置は粘性を有するサンフルを均一に混せ合わせるのにも大変適しています。