

Application Note AN-T-220

# Sodium chloride content in dough and bread

## Determination of the sodium chloride content according to AOAC 971.27

For millenia, bread and salt—the staple food of humankind, has been vital for sustenance. Salt has been known as the «white gold» since ancient times and is what enhances the flavor in many products.

The increase of health consciousness in the past few decades has led to efforts in reducing the sodium chloride content in all food products. If consumed in excess, sodium may damage the cardiovascular system. It is therefore in the interest of food manufacturers to reduce the salt content and while preserving the flavor of the food.

To ensure consistent quality, it is critical to know the exact salt content in the raw materials and the final products. This is only possible by performing precise measurements during the production process.

It is possible to determine sodium chloride in dough and bread quickly according to AOAC 971.27 with the Eco Titrator equipped with an Ag Titrode.

## SAMPLE AND SAMPLE PREPARATION

This application is demonstrated on bread dough made from white flour and whole wheat bread.
An appropriate amount of sample is weighed into the sample beaker and $CO_2$-free water is added. Then the sample is homogenized with the Polytron.

## EXPERIMENTAL

The determinations are carried out on an Eco Titrator equipped with an Ag Titrode and a Polytron for sample preparation.
An appropriate amount of sample is weighed into the sample beaker and $CO_2$-free water as well as nitric acid solution is added.
While stirring, the solution is titrated until after the first equivalence point with standardized silver nitrate solution.



**Figure 1.** Eco Titrator equipped with an Ag Titrode.

## RESULTS

Well-defined NaCl values and titration curves are obtained for the tested samples.

The results are summarized in Table 1. An exemplary titration curve is displayed in Figure 2.

**Table 1.** Results for the sodium chloride content according to AOAC 971.27 with an Eco Titrator equipped with an Ag Titrode.

| Sample (n = 6) | Mean NaCl in % | SD(rel) in % |
|---|---|---|
| Bread dough | 1.03 | 0.1 |
| Whole wheat bread | 2.31 | 0.1 |

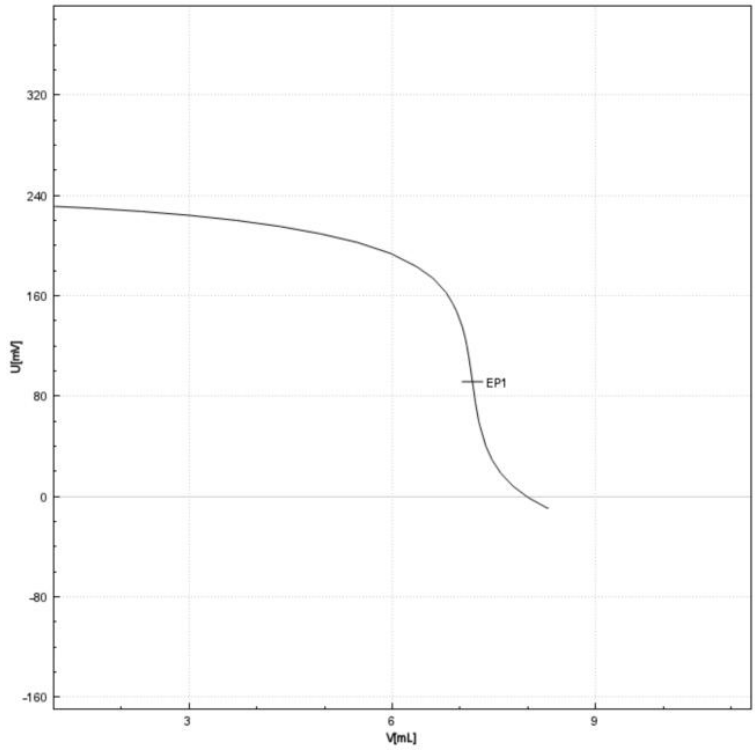



**Figure 2.** Titration curve of the determination of the sodium chloride content of whole wheat bread on an Eco Titrator.

## CONCLUSION

Titration is a precise and reliable method to determine the sodium chloride content in dough and bread. Using the Eco Titrator equipped with an Ag Titrode allows a fast determination. The system offers both low-priced and user-friendly handling. Pre-installed methods on the Eco Titrator makes it easy for customers without laboratory experience to get started with precise and fast titrations, perfect for bakeries.

Internal reference: AW TI CH1-1315-012021

## CONTACT

Metrohm AG
Ionenstrasse
9100 Herisau

info@metrohm.com

## CONFIGURATION



### Eco Titrator Salt

The compact Eco Titrator with integrated magnetic stirrer and touch-sensitive User Interface is ideal for routine analysis. It provides GLP-compliant results with minimum space requirements at all times (approx. DIN A4).

The Eco Titrator Salt plus offers you the complete package for the analysis of chloride in a wide variety of samples. The package contains a titrator, a 10 mL cylinder unit and an Ag Titrode, a maintenance-free electrode for precipitation titration with silver nitrate.




### 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.