

# Salt Measurement in Food and Beverage with AT1000 Automatic Titrator

## Introduction

Salt (NaCl) is present in many foods such as meats, canned products, dried soups, and dairy produce. In the food industry, salt addition improves the conservation, appearance, and taste of food.

Salt analysis is common practice in the food industry, and the automated titration technique is a simple and standardized analysis. This measurement is performed in R&D, Production and/or Quality Control labs, on raw material or final products.



### Maximum Simplicity: Ready to Use

With AT1000, simplified implementation makes analysis accessible to all at a competitive cost. No programming or technical knowledge is required. Place the sample into the beaker and press a button!

### Flexibility When You Need It

The AT1000 provides the ability to measure other additional parameters with one device: Total Acidity and Free/Total SO<sub>2</sub> in wines. Automation of sample series is easy and cost effective by connecting an AS1000 sampler. This multi-parameter automation solution releases operators' time from cumbersome and repetitive analyses.

### Safety

During titration, users of the AT1000 are not in direct contact with reagents even for sample preparation (acidification). In addition, AT1000 titration methods do not use potentially dangerous color indicators.

### Maximum Analytical Quality and Traceability

Automatic measurements guarantee accurate results with repeatable and reliable operations. For complete traceability, AT1000 archives all analysis data and can be exported to USB in an Excel compatible format. PC software is also available as an option.

## Automated Titration Technique

The AT1000 application uses a potentiometric titration with a combined silver/reference electrode and AgNO<sub>3</sub> titrant. Equivalence point is detected using the inflexion point mode. The sample is automatically acidified before titration. This method is normalized (ISO 1738.1997 / ISO 1841-2).

For the determination of salt in food products, the AT1000 offers:

- Application for liquids with sample in volume and result in g/L
- Application for solids (cheese, tomato sauce, ...) with sample in weight and result in %
- For an amount of solid sample between 1 and 5 g, the working range is 0.1 to 5% NaCl
- For an amount of liquid sample of 50mL, the working range is 0.1 to 1 g/L NaCl
- Higher concentrations can be performed by using a smaller amount of sample
- Optional AS1000 Sample Changer with multi-parameter automation solutions free up time to release operators from cumbersome repetitive analyses.

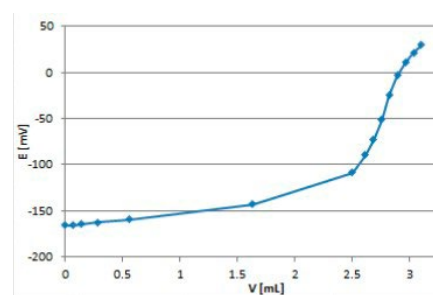


Fig 1: Titration Curve

## Comparison Between Automatic and Manual Titration:

	AT1000 Automatic Titration	Manual Titration
Easy to Use	No need for sample preparation (automatic acid addition by pump, no color indicator needed). Automatic measurement by pressing one button	Manual sample preparation with acid and color indicator addition. Need certain expertise and burette maintenance (rinse,...).
Accuracy and Repeatability	Accurate and repeatable measurement (electrochemical measurement). Not operator dependent.	Bad accuracy and repeatability because color change is difficult to see (precipitation). Very operator dependent (visual perception)
Safety	Good safety with minimal reagent contact. No need to use color indicator. Automatic acid addition before titration.	Risky with direct exposure to reagent and CMR color indicator.
Use Cost	Quick Return on Investment compared to manual titration related to lower titrant consumption, lower maintenance, and time saved (AgNO <sub>3</sub> is an expensive reagent)	Cheap equipment but extensive time and higher titrant consumption than automatic titrator (use and rinse). Risk of spillage and breakage. (AgNO <sub>3</sub> is an expensive reagent)
Evolvity / Extra Parameters	Extra parameters available (pH, Total Acidity, Salt, SO <sub>2</sub> ...) on the same instrument	No extra parameters possible with the same equipment
Traceability	Complete traceability with easy export features (USB or PC software)	No traceability
Automation	Sample changer available for high throughput	No automation

## Summary

Automatic Chloride titration offers many key benefits compared to manual titration:

- Safe and easy to use
- More accurate and repeatable analysis
- Short return on investment compared to manual titration

## Ordering Information

- AP0010.AT1112: Application kit including the silver probe and all accessories needed for Chloride measurement
- AT1112: Titrator with 1 syringe for titration and 1 pump for automatic acid addition
- 2321953: AgNO<sub>3</sub> 0.1N reagent for titration (titrant)
- 254049: HNO<sub>3</sub> 1:1 acid for sample preparation
- 18201H: NaCl solid form for titrant calibration
- Sample Changers AS1000: ask for more information regarding the different models and capacities

USB stick included in the application kit contains pre-programmed and optimized methods (salt in liquid food and salt in solid food).

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