

Application Note AN-T-217

Hypochlorite and sodium chloride in disinfectant

Reliable all-in-one determination by argentometric titration

Disinfectants play an important role worldwide. Especially in times of widespread diseases, it is essential to protect humans and animals from harmful bacteria, viruses, or fungi. Animal diseases such as bird or swine flu or more communicable viruses like COVID-19 can cause billions in economic damage and even destroy entire industrial sectors.

Sodium hypochlorite and sodium chloride can be effectively used as disinfectants for water and for surfaces. They are widely available and inexpensive. However, it is essential to make the correct dilution in order to achieve the most efficient disinfection. The World Health Organization (WHO) recommends (depending on the application) concentrations in disinfectants of 1000–5000 mg/L NaOCl and up to 200 g/L NaCl.

This Application Note demonstrates a reliable method to determine the hypochlorite and sodium chloride content in disinfectants by two subsequent argentometric titrations in the range recommended by the WHO.

SAMPLE AND SAMPLE PREPARATION

Two samples containing approximately 500 mg/L (Sample 1) and 5000 mg/L (Sample 2) sodium hypochlorite and approximately 200 g/L sodium chloride in each are analyzed. No further sample preparation is required.

EXPERIMENTAL

The analysis consists of two subsequent titrations with silver nitrate. In a first titration, the sodium hypochlorite content is determined by back-titration of an excess of potassium iodide. Immediately afterwards, the sodium chloride content is determined in the same sample.

The analysis is performed on a system consisting of an OMNIS Advanced Titrator and OMNIS Dosing Modules equipped with an Ag-Titrode.

After transferring an appropriate amount of sample into the titration vessel, a sufficient amount of deionized water is added to immerse the electrode. Nitric acid and potassium iodide are added, and the titrations are carried out using standardized silver nitrate as titrant.

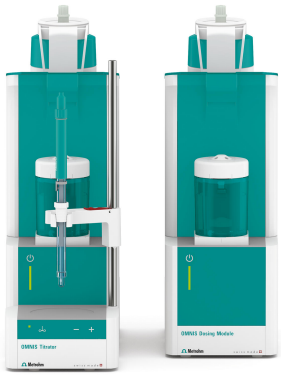


Figure 1. OMNIS Advanced Titrator and OMNIS Dosing Module equipped with Ag-Titrode for the determination of hypochlorite and sodium chloride content in disinfectant.

RESULTS

The analysis demonstrates acceptable results. The lower hypochlorite content and higher standard deviation are due to the instability of hypochlorite. It is therefore recommended to analyze the sample immediately after sampling. The results are displayed in Table 1.

Table 1. Results of the hypochlorite and sodium chloride determination in disinfectants (n = 6)

	Sample 1	Sample 2
Hypochlorite content in mg/L	460	4993
SD(rel) in %	7.4	1.1
Sodium chloride content in g/L	202.4	198.3
SD(rel) in %	0.3	0.7

CONCLUSION

Titration is a precise and reliable method to determine the hypochlorite and sodium chloride content in disinfectants.
Using an OMNIS Advanced Titrator equipped with an Ag-Titrode allows a fast all-in-one determination. The OMNIS system offers the opportunity to customize the system according to your need and expand it for other required titration applications.

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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.