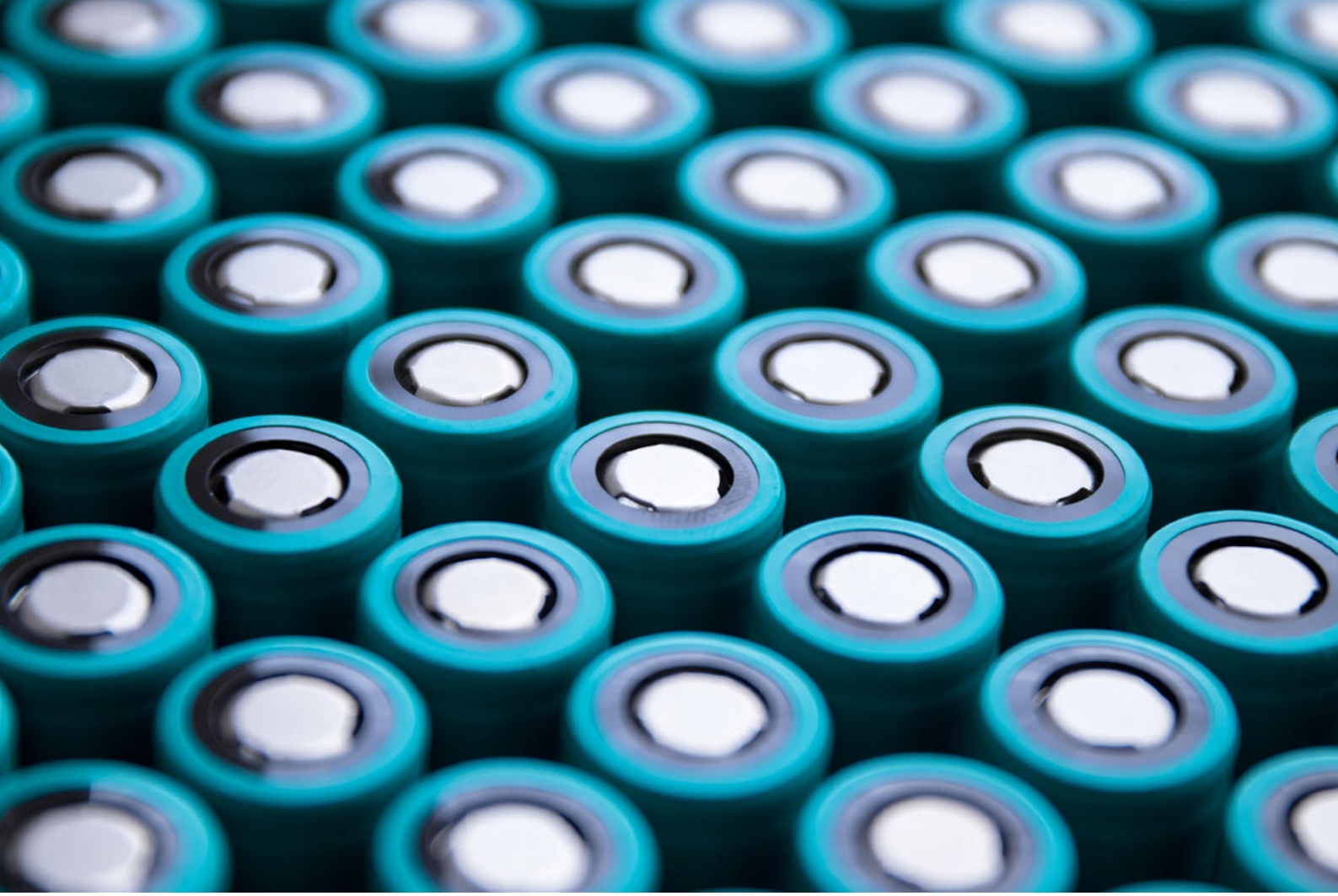


Application Note AN-T-252

Chloride in lithium carbonate by potentiometric titration

Determination of chloride in lithium carbonate by potentiometric titration according to draft standard ISO 12403

Accurate quantification of chloride impurities in lithium carbonate is essential to ensure the material's suitability for high-performance applications, particularly within the battery industry. During lithium-ion battery production, even trace levels of contamination in the raw materials can influence cathode quality, manufacturing consistency, and overall electrochemical behavior.

This Application Note describes a method for determining chloride content in lithium carbonate by potentiometric back - titration according to ISO 12403. Excess silver nitrate (AgNO3) was added to the acid - dissolved sample, and the remaining silver was titrated with sodium chloride (NaCl) to the first equivalence point.

SAMPLE AND SAMPLE PREPARATION

This method is applicable to determine chloride content in lithium carbonate (Li_2CO_3) in the range of 10 mg/kg to 650 mg/kg. The samples are dried at 250 ° C for two hours and allowed to cool down before use.

EXPERIMENTAL

The analysis is carried out on an OMNIS Advanced Titrator (Figure 1) equipped with a dAg-ring electrode. Nitric acid is added to acidify the sample, and a known amount of silver nitrate is added prior to analysis.
A blank measurement is performed and titrated with sodium chloride solution until after the equivalence point. An appropriate mass of sample is weighed and titrated with sodium chloride solution until after the equivalence point.



Figure 1. OMNIS Advanced Titrator equipped with a dAg-ring electrode.

RESULTS

The samples were tested in duplicate on one day, and once again on the following day. Results are displayed in Table 1. Figure 2 shows an example titration curve for the analysis.

Table 1. Results of the chloride determination in lithium carbonate samples. Sample ID number relates to the expected chloride impurity in mg/kg.

Sample ID (n = 3)	Content mean value Cl (mg/kg)	SD(rel) in %
10	0.00	0.00
50	60.04	3.97
115	141.36	1.93

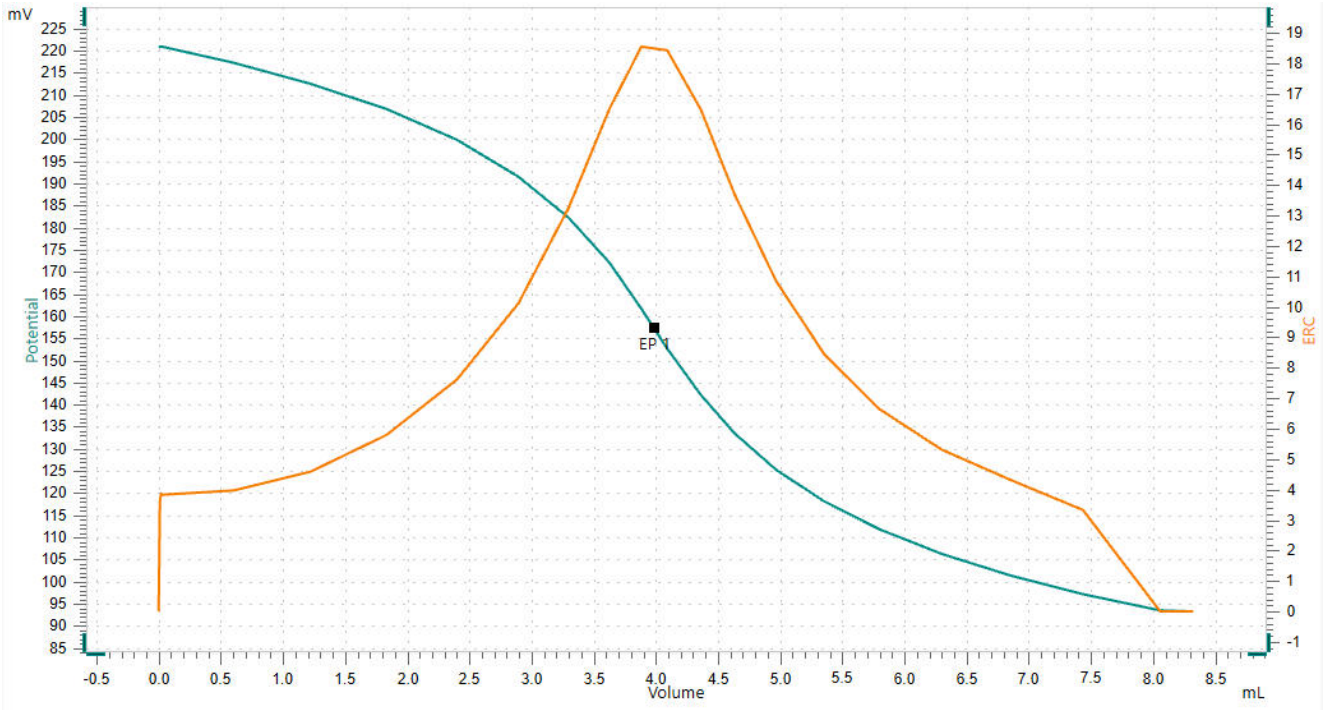


Figure 2. Titration curve of the chloride content in lithium carbonate.

CONCLUSION

The OMNIS Titrator provides a fast and reliable determination of chloride in lithium carbonate according to draft standard ISO 12403. The OMNIS system can be expanded to other titration applications as required.

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CONFIGURATION



OMNIS Professional Titrator

创新型、模块式电位分析 OMNIS Titrator,适于独立运行或作为 OMNIS 滴定系统的核心元件运行,用于终点和等当点滴定(单一/动态)。由于采用 3S OMNIS Liquid Adapter 技术,处理化学品从未像现在一样安全。可以使用测量模块和计量管单元自由配置滴定仪,并在需要时扩展一台棒式搅拌器。包括用于使用其他滴定或加液模块平行滴定的“Professional”功能许可证。

- 通过计算机或本地网络控制
- 可以为其他应用或辅助溶液另外连接最多四个滴定模块或加液模块
- 棒式搅拌器的连接方式
- 可提供不同大小的计量管:5、10、20 或 50 mL
- 采用 3S 技术的 OMNIS Liquid Adapter:安全处理化学品,自动传输生产厂家的原始试剂数据

测量模式和软件选项:

- 终点设定滴定:“Basic” 功能许可证
- 终点和等当点滴定(单一/动态):“Advanced” 功能许可证
- 终点和等当点滴定(单一/动态),包括 5 路平行滴定:“Professional” 功能许可证



OMNIS 20 mL

智能型计量管单元 20 mL,用于 OMNIS 滴定仪、滴定模块或 Dosing 模块。包括计量软管和防扩散滴管。



OMNIS 滴定仪或滴定模块的数字测量通道,用于连接数字电极“dTrodes”。



dAg

带固定套管式隔膜的 OMNIS 用数字组合式银环形电极。

该电极适用于 pH 值变化的沉积滴定(硝酸银滴定剂),例如:

- 氯化物、溴化物、碘化物
- 硫化物
- 硫化氢
- 硫醇
- 氰化物

固定套管式隔膜对污染不敏感。作为参考电解液并进行制备时使用了 $c(KNO_3)$ = 1 mol/ L。

dTrodes 可在 OMNIS Titratoren 上使用。