



Application Note AN-T-215

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Precise and reliable determination by potentiometric titration

Lithium salts (e.g., lithium carbonate and lithium hydroxide) are used in many applications such as the production of electrolyte and cathode materials in lithium ion batteries. Furthermore, lithium hydroxide is used for the production of lithium stearate, an important lubricant for cars and airplanes. In addition, it is utilized as an air purifier due to its ability to bind carbon dioxide. While the majority of lithium carbonate is used for aluminum production, it is also used for the glass and ceramic industry. Lithium carbonate

lowers the melting point of these materials. Thus, the electricity costs are cheaper to produce them. Additionally, it is a treatment of mental illnesses such as depression or bipolar disorder. For all of these applications, it is important to know the quality of the pure lithium salts used in the various production processes. This Application Note presents an easy method for the assay of lithium hydroxide and lithium carbonate on an automated OMNIS system.

SAMPLE AND SAMPLE PREPARATION

Lithium hydroxide and lithium carbonate can be directly analyzed without any sample preparation. For the assay of lithium hydroxide,

it is of importance that the water is free from carbon dioxide, otherwise this would interfere with the titration.

EXPERIMENTAL

Both assays are carried out on an automated system consisting of an OMNIS Sample Robot S and an OMNIS Advanced Titrator equipped with a dEcotrode plus.

After the sample is weighed into the beakers, the dilution and titration of the sample is automatically done by the system. The sample is titrated with hydrochloric acid until after the equivalent point.

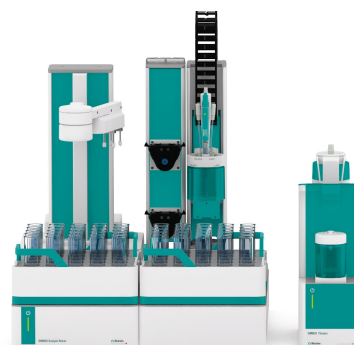


Figure 1. Sample Robot and OMNIS Titrator Advanced equipped with dEcotrode plus for the assay of lithium hydroxide and lithium carbonate.

RESULTS

For both assays, reproducible results with relative standard deviations below 0.4% ($n = 5$) are obtained. Additionally, carbonate impurities

within the lithium hydroxide sample can be detected.

Table 1. Results of the assay of lithium hydroxide and lithium carbonate.

n = 5	Purity of LiOH in %	Purity of Li_2CO_3 in %
Mean	99.20	100.78
SD(abs)	0.24	0.34
SD(rel)	0.24	0.34

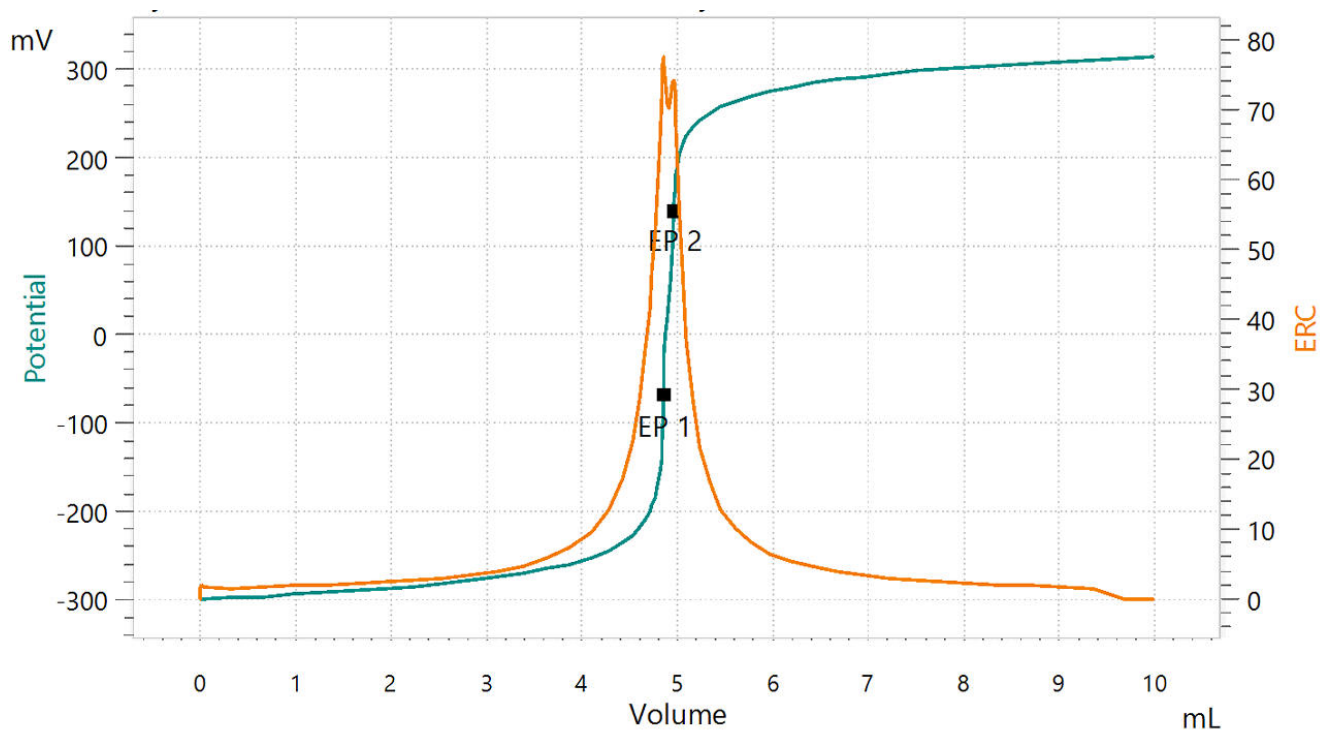


Figure 2. Titration curve of the assay of lithium hydroxide. The second equivalence point corresponds to lithium carbonate impurities.

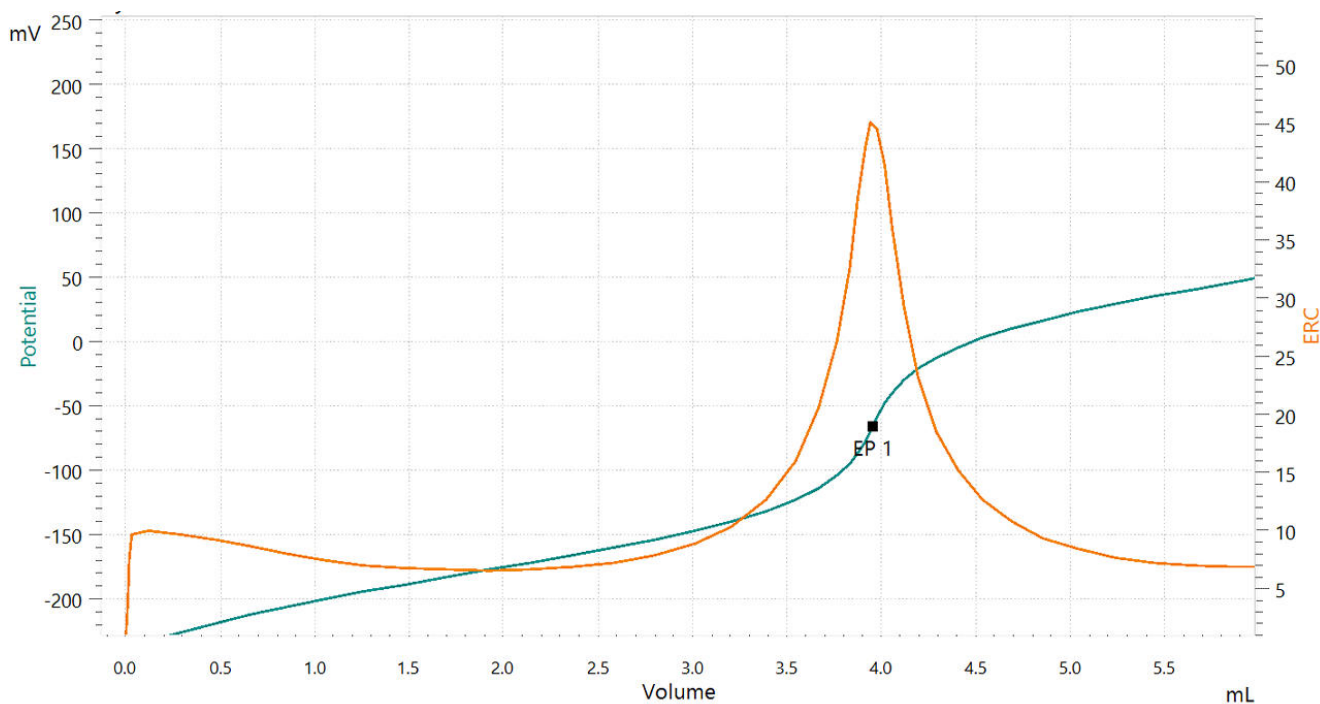


Figure 3. Titration curve of the assay of lithium carbonate.

Titration is a precise and reliable method for the assay of lithium hydroxide and lithium carbonate. Using an automated OMNIS system allows you to analyze up to four samples simultaneously. The

OMNIS system can be customized according to your needs, and expanded for other titration applications required for quality control.

Internal reference: AW TI CH1-1302-042020

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CONFIGURATION



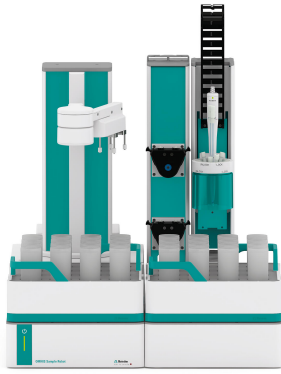
OMNIS Advanced Titrator

新型、模式位分析 OMNIS Titrator 滴定,用于行点和等当点滴定(一/)。由于采用 3S 瓶配器技,理化学品很安全。可以使用量模和量管元自由配置滴定,并在需要展一台拌器。在需要可以通相的件功能可平行滴定升 OMNIS Advanced Titrator。

- 通算机或本地网控制
- 可以其他用或助溶液外接四个滴定模或加液模
- 可以展磁力拌器和/或螺旋拌器
- 可提供不同大小的量管:5、10、20 或 50 mL
- 采用 3S 技的瓶配器:安全理化学品,自生商的原始数据

量模式和件:

- 点定滴定:“Basic” 功能可
- 点和等当点滴定(一/):“Advanced” 功能可
- 点和等当点滴定(一/),包括平行滴定:“Professional” 功能可



OMNIS Sample Robot S Pick and Place

OMNIS Sample Robot S 具有一个“蠕”模(2 通道)和一个 Pick&Place 模以及大量附件,可直接入全自滴定。此系具有个品位置,可用于 32 个 120 mL 的品。此模化系供已完全安装完,因此可在短内投入行。

系也可根据需要展配外台蠕以及多加一个 Pick&Place 模,由此使通量翻倍。如果需要更多工作台,可将此 Sample Robot 展 L 格款型的 OMNIS Sample Robot,由此可使七个品的品在多四个 Pick&Place 模上并行理,将品通量大四倍。



dEcotrode Plus

用于 OMNIS 的数字、合式 pH 。

用于酸/水溶液滴定。

固定套管式隔膜染不敏感。

参比解: $c(\text{KCl}) = 3 \text{ mol / L}$,存在保存液中。

dTrodes 可在 OMNIS Titratoren 上使用。