Goldschmidt 2022 Abstract
https://doi.org/10.46427/gold2022.12778

Application Advantages of a HR-ARRAY ICP-OES for The Trace Analysis of Lithium Carbonate for Lithium-Ion Battery Applications

SANDRO SPILLER

Analytik Jena GmbH

Presenting Author: sandro.spiller@analytik-jena.de

The performance of new storage media for electrical energy as well as strong price fluctuations for fossil fuels make electromobility a beacon of hope for a long-term future of individual mobility. The basis for future-oriented electric drive systems lies in batteries, especially lithium-ion batteries (LIBs) due to their advantages (e.g., costs, energy density, weight).

The demands on LIBS are constantly increasing in terms of lifetime and capacity. Therefore, the requirements on the raw materials are also constantly increasing. Currently, Li_2CO_3 with a purity of 99.5% is referred to as battery grade. However, the trend in the industry is clearly moving towards ever purer raw materials with purities greater or equal than 99.9%. As the requirements for the battery material increase, the sensitivity and matrix compatibility of the analytical technique must be guaranteed.

It is well known that inductively coupled plasma optical emission spectrometry (ICP-OES) provides a robust, rapid, multi-element analysis for many sample types. Therefore, it also has become one of the most popular tools for the determination of trace impurities in lithium battery materials.

Here we present the application advantages for trace analysis in Li_2CO_3 originating from an ICP-OES instrument with high-resolution (HR) optics (2 pm @ 200 nm), intelligent torch design, high plasma robustness and exceptional sensitivity resulting in interference-free analysis of all investigated analytes in the low to sub-ppb range.