Application Note BATT1011

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BATT1011 - Measurement of Cathode Material NCM Using XSPA-400 ER High-Energy Resolution Detector

Introduction

In XRD using Cu radiation sources, peak profile backgrounds for cathode materials are generally high due to the effects of the transition metal elements they contain. This makes the detection of trace crystal phase peaks difficult. The XSPA-400 ER uses high energy resolution to decrease X-ray fluorescence originating from samples and reduce background components to achieve higher-sensitivity measurements compared to traditional detectors.

Crystal phase analysis

- **Analysis:** Cathode material
- **Analysis method:** Qualitative analysis
- **Use:** Optimizing electrochemical performance
- **Analyzed materials:** $Li(Ni_xCo_yMn_z)O_2$, NCM

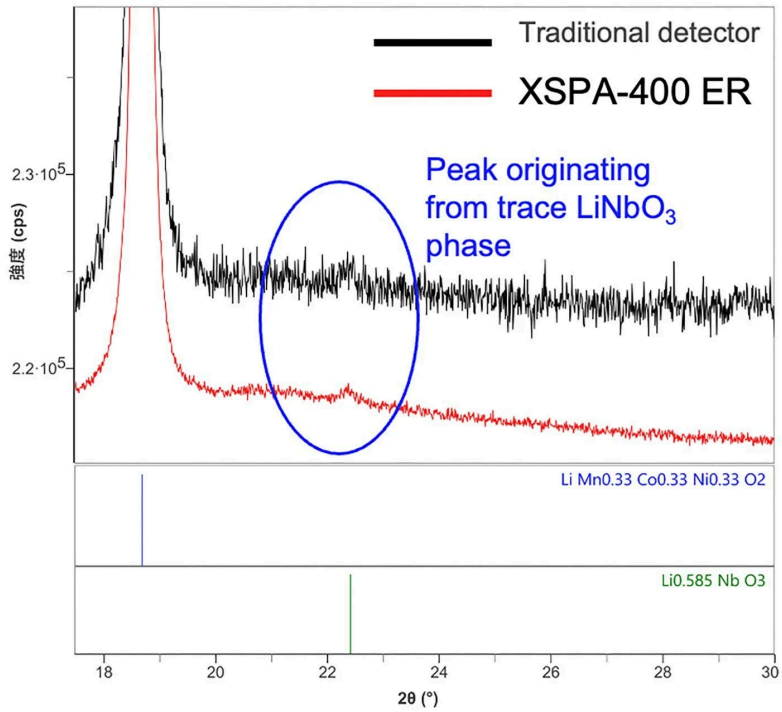

Figure 1: Profile measured using traditional detector and XSPA-400 ER

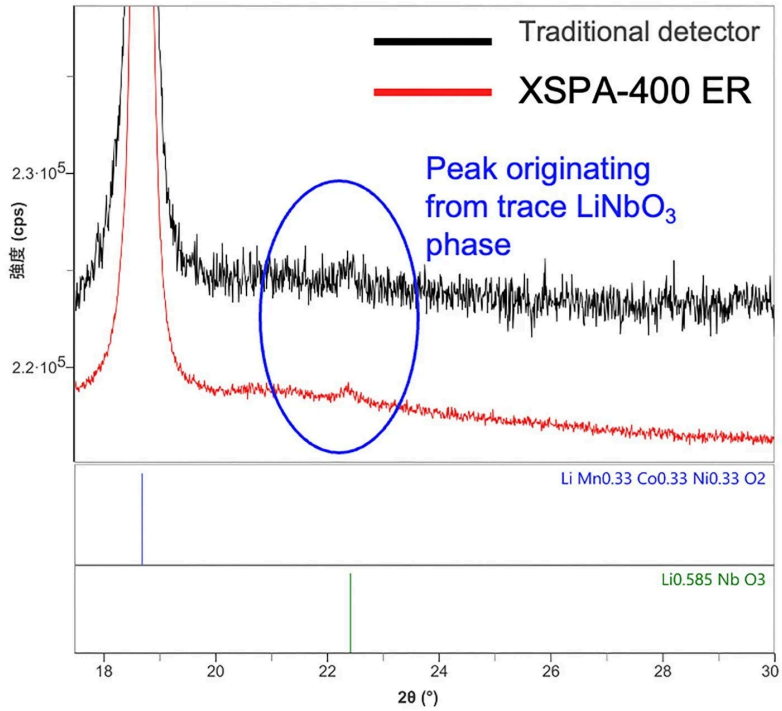

Figure 2: Magnified XRD profile measured using traditional detector and XSPA-400 ER

Conclusion

The XSPA-400 ER successfully lowers background compared to traditional detectors. As such, it makes it easier to observe minute peaks, which means trace crystal phases can be observed.

Related products

SmartLab SE

Highly versatile multipurpose X-ray diffractometer with built -in intelligent guidance

SmartLab

Advanced state-of-the-art high-resolution XRD system powe red by Guidance expert system software

XSPA-400 ER

high energy resolution pixel detector capable of 0, 1, and 2D measurements