Application Note BATT1007

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BATT1007 - Impurity Analysis for Graphite Anodes

Introduction

In impurity control for graphite, which is used as an anode, XRF enables element analysis on ppm order in a non-destructive manner with the material still in powder form. Even trace Na and Mg impurities that are difficult to analyze with energy dispersive X-ray fluorescence (EDXRF) can be analyzed with precision using wavelength dispersive X-ray fluorescence (WDXRF). Additionally, with the standardless FP analysis method, it is possible to analyze from ppm levels of light to heavy elements up to 100% without preparing a calibration curve using standard samples.

Composition analysis

- **Analysis:** Processed materials
- **Analysis method:** Standardless FP analysis method
- **Use:** Quality assurance
- **Analyzed materials:** Graphite anodes

Table 1: Standardless FP analysis results for commercially available graphite samples

Sample	Na	Mg	Al	S	Ca	Fe	Zr
A	83	249	28	38	73	39	13
B	N.D.	975	24	2958	41	6	N.D.
C	81	242	42	76	81	180	4

Figure 1: Sample preparation using loose powder method with commercially available graphite samples

Conclusion

A considerable amount of high-concentration S impurity components were detected in Sample B. A considerable amount of Fe impurity components were detected in Sample C. XRF analysis enables measurement with simple sample preparation that consists solely of filling the container with sample powder.

Compared to EDXRF, WDXRF has higher energy resolution and is less prone to being affected by interfering lines, making it possible to obtain high sensitivity even with light elements such as Na and Mg. As such, with WDXRF, highly reliable analysis values can be obtained for a wide range of elements.

Related products

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th new ZSX Guidance expert system software