

BATT1008 - Impurity Analysis for Silicon Metal Anode Material

Introduction

Si metals, which are used as anodes, are often recycled from silicon wafer scrap. As such, they require impurity control upon acceptance. With the X-ray fluorescence analysis method, it is possible to nondestructively analyze elements at ppm level with the material still in powder form. Even Al impurities in Si matrices, which present difficulties with energy dispersive X-ray fluorescence (EDXRF), can be analyzed with precision using wavelength dispersive X-ray fluorescence (WDXRF).

Composition analysis

- **Analysis:** Recycled materials
- **Analysis method:** Matrix correction calibration curve
- **Use:** Screening
- **Analyzed materials:** Si metal anodes

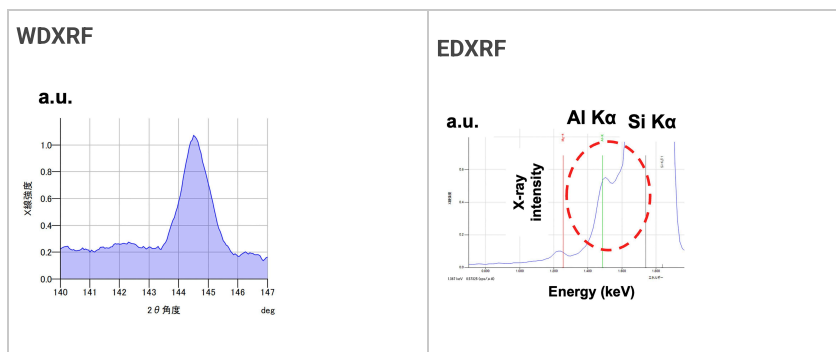


Figure 1: Al spectrum comparison of WDXRF and EDXRF

Table 1: Standardless FP analysis results for electrode grade Si powder

Elements	Al (ppm)	Fe (ppm)	Ca (ppm)
Analysis Value	1754	832	270

Conclusion

Al, Fe, and Ca impurities were detected by XRF analysis. On the EDXRF spectrum, the Al peak overlaps with the Si peak. On the WDXRF spectrum, however, it is possible to obtain an Al peak without overlap, making trace analysis possible.

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