

CALCULATION OF FLUORESCENT X-RAY INTENSITY FOR CONFOCAL MICRO-XRF ANALYSIS OF INHOMOGENIOUS SAMPLES - Part 2

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Confocal micro-XRF (CMXRF) is a method which has advantages in depth analysis, elemental imaging at a specific depth and therefore, three dimensional elemental map analysis. It has been applied to various analyses.

We built a fluorescent intensity calculation procedure for CMXRF of any inhomogeneous samples based on the “mosaic model” [1]. This calculation includes secondary excitation enhancements as well as absorptions within a sample. It was evaluated by using experimental results on a sample of a vertical border [2] and a two-wire sample [3]. The agreement between the calculated and measured results remained qualitative level in those evaluation, as the incident x-ray beam and the detection path direction were assumed as parallel for simplicity. The calculation was needed to be modified to take into account the beam size and divergence even in the off-focus area for calculation of the secondary enhancement.

In this presentation, we will show evaluation results of refined calculation using measurements on some inhomogeneous samples.

References

- [1] Tsuji, K., Tabe, A., Wobrauscheck and P., Strel, C. (2015) Powder Diffr. **30**, 109–112.
- [2] N. Kawahara, T. Matsuno, Y. Takimoto and K. Tsuji, (2016) Adv X-ray Anal **59**, 77-84.
- [3] N. Kawahara, T. Matsuno and K. Tsuji, "Calculation of fluorescent x-ray intensity for confocal micro-XRF analysis of inhomogeneous samples", DXC **2016**, F-24