

COMPARISON AND CHARACTERIZATION OF KEY PARAMETERS OF TWO CONFOCAL MICRO-XRF SPECTROMETERS

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Micro X-ray Fluorescence (Micro-XRF) is an analytical technique to determine the spatial distribution of major, minor and trace elements in a sample. It is used worldwide to analyze samples from different fields. Confocal micro-XRF extends this technique to three dimensional analysis by creating a well defined measurement volume. By scanning the sample direct 3D information can be obtained without deconvolution.

Two different confocal micro-XRF spectrometers have been developed and installed at Osaka City University (OCU) and the Vienna University of Technology Atominstitut (ATI). The OCU system is a high resolution spectrometer operating in air. The ATI spectrometer has a lower spatial resolution but is optimized for light element detection and operates under vacuum condition. In the course of a running cooperation between OCU and ATI the performance of both spectrometers was compared in order to improve spectrometer performance and get new insights into confocal micro-XRF. Several different samples and sample types were measured (forensic, cultural heritage, scientific) at OCU and ATI. Special attention was given to depth profiling of layer samples by scanning the sample perpendicular to the surface.

In this work the two spectrometers and their characteristics like spatial resolution and lower limits of detection will be presented. Furthermore the results of the analysis of several samples will be shown.

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