

LIGHT ELEMENT MAPPING BY μ XRF SPECTROMETRY

Armin Gross, Roald Tagle
Bruker AXS Microanalysis GmbH,
Schwarzschildstr. 12, 12489 Berlin, Germany
armin.gross@bruker-axs.de, fax: +49 30 670 990 30

Mobile spectrometer for energydispersive micro X-ray fluorescence spectrometry are specifically designed for the demands of archaeometry. They combine the advantages of non-destructive and sensitive multi-elemental analysis at sub-mm resolution with the possibility of working outside the laboratory.

The detection of light elements is restricted due to the fluorescence absorbance by air, which can be partially avoided by a helium flush of the space surrounding the measured area. A further improvement of the detection limits is achievable by optimization of the excitation conditions and the detector technology. Recently, a spectrometer design was introduced, which allows a fast exchange of the excitation source including X-ray tubes with different target materials and X-ray optics, e.g. polycapillary lenses or collimators.

In this article the application of a low-power X-ray tube with Cr target in combination with different collimator sizes for improved light element detection is described. In addition a new large area detector with pulsed reset electronics allowed the sampling of high count rates at unchanged energy resolution.

Improved detection limits for light elements enables fast element mapping of any object. First promising measurements and limitations are demonstrated for art and relating samples.