TRACE ELEMENT ANALYSIS OF MICRO-XRF BY PINPOINT CONCENTRATION METHOD

Atsushi Bando, Hitomi Ono, Kosuke Tsujita, Hiroshi Uchihara
HORIBA, Ltd., 2 Miyanohigashi, Kisshoin, Minami-Ku, Kyoto 601-8510, Japan

The X-ray fluorescence (XRF) analysis is a fast and powerful method for elements identification. Over the last several years, the trace element analysis of the solution becomes an important application of XRF. However, the sensitivity and reproducibility of this method is insufficient because of the influence of scattered X-rays from a solution. This presentation will provide practical insights into the application of the XRF Microscope to the analysis of trace elements using the new substrate which will allow to detect as small as nano-gram concentration of the trace elements.

The non-wetting surface of polymer film made of very thin PET (Polyethylene terephthalate) film coated with fluroplastic was used as substrate and it reduces background of the spectrum in several times. Standard solutions for AAS (Atomic Absorption Spectroscopy) were deposit on the film and this set of samples allows to dry at ambient conditions to form array of spots with different concentration. Each sample was analyzed by the analytical X-ray microscope XGT-7000 using 100 microns monocapillary. It was found linear dependence of the X-ray intensity from concentration for all elements we studied. Minimum Detection Limits for major elements as Fe, Cu, Pb are in the range of nano-grams.

EDXRF spectra for different elements and at different concentration will be presented along with the applications examples.