

## **ANALYSIS OF HEAVY AND LIGHT ELEMENTS BY COMPACT X-RAY FLUORESCENCE SPECTROMETER**

K. Muraoka, Y. Araki, T. Utaka, and K. Taniguchi

Institute of X-ray Technologies Co. Ltd,  
Dai-3 Maruzen-Bldg. 3-5-21, Kigawahigashi, Yodogawa-ku, Osaka 532-0012, Japan

The Energy Dispersive X-ray Fluorescence Analysis (EDXRF) is a very popular analytical method for screening, of whose advantage is to simultaneously inspect the multiple heavy elements in non-destructive manner.

The compact (approx. 14kg) EDXRF that performs on-site analyses of heavy and light elements for soil, plastic and metal has been developed. The specialized analyzers (for WEEE & RoHS, Soil and Toy) are developed for the detection of hazardous elements in such kind of samples. The compact X-ray tube (W target, maxima 48kV and 0.2mA) and silicon drift detector realizes for downsizing, and higher energy resolution, respectively. The digital signal processor is also applied for high counting measurement and higher energy resolution. In this work, the fundamental parameter method is approached also.

For demonstration in plastic measurement, Cr, As, Se, Br, Cd, Sb, Ba, Pb and Hg are measured simultaneously, and also light elements S and Cl are measured by this analyzer. For the quantitative analysis, not only calibration curve method but also fundamental parameter method are applied depend on some request. In the simultaneous analysis, we studied how to measure optimization of a primary filter for continuous X-ray from a W target, also to use secondary filter in order to prevent Cr-K $\alpha$  intensity from almost absorption decreasing. The overlap correction of the Pb-L $\eta$  peak for Se-K $\alpha$ , the Pb-L $\alpha$  peak for As-K $\alpha$  and the Cd-K $\beta$  peak for Sb-K $\alpha$  are performed respectively. As a result, the minimum detection limits of below 3ppm for As, Se, Br, Cd, Pb and Hg is achieved, and 15ppm for S is also achieved respectively, and 5ppm was obtained for Cd in Brass. Some actual results obtained by the EDXRF "ED-05" will be introduced later.