



## **Analysis of hazardous elements in soil by compact X-ray fluorescence spectrometer**

**K. Muraoka**, Y. Araki, N. Kawada, T. Papp, T. Utaka, and K. Taniguchi

(1) Institute of X-ray Technologies Co., Ltd., (2) Cambridge Scientific  
(taniguti@isc.osakac.ac.jp / Fax: +81-6-6886-2762 / Phone: +81-6-6886-2761)

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

The compact (approx. 14 kg) EDXRF that performs on-site analyses of hazardous elements in soil is developed (Photo.1). The compact X-ray tube ( W target, maxima 48kV and 0.2mA) and Si surface drift detector are selected for downsizing, and higher energy resolution, respectively. The digital signal processor is applied for the fundamental parameter approach and high counting measurement.

Cd, Pb, As and Se are measured simultaneously, and also light element S is measured by this spectrometer. The calibration curve method is applied for the quantitative analysis. In the simultaneous analysis, we studied how to analyze without secondary filters in order to prevent the X-ray intensity of the elements from decreasing. The sum peak of Fe which interferes with quantifying Pb is adjusted, by applying an overlap correction. And also the overlap correction of the Pb-L $\eta$  peak for Se-K $\alpha$ , and the Pb-L $\alpha$  peak for As-K $\alpha$  are performed respectively. As a result, the minimum detection limits of below 3 mg/kg for Cd, Pb, As and Se, and also achieved 50 mg/kg for S are achieved respectively.