QUANTITATIVE ANALYSIS OF LOW LEVEL TOXIC ELEMENTS IN SURFACE LAYER USING HDXRF

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Energy dispersive X-ray Fluorescence is a well-established and powerful tool for nondestructive elemental analysis for virtually all materials. However, measurement of toxic element concentration in thin paint layer remains as a great challenge due to the lack of the knowledge about layer density and thickness.

A particular EDXRF method, XRF with multiple monochromatic beam excitation based on doubly curved crystals, is used to measure Pb, Hg, and Cr in thin paint layers on various substrates. This multiple monochromatic beam EDXRF technique, call High-Definition XRF (HDXRF), enables high sensitivity, small spot, and layer analyses.

A set of samples with paint layers on plastic substrates is prepared by a defined procedure. These samples contain various Pb, Hg and Cr levels in the paint layers. The concentrations of Pb, Hg and Cr are measured by both the HDXRF method and ICP-OES method. In this paper, the data will be presented and discussed.