

## QUANTITATIVE ANALYSIS OF TOXIC ELEMENTS IN CONSUMER PRODUCTS AND ENVIRONMENTAL SAMPLES BY HIGH DEFINITION XRF

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XRF is a powerful tool for screening or semi-quantitative analysis for toxic elements in consumer products. However, quantitative analysis is a challenge due to the sample complexity. The complexities include a variety of matrices, small sizes, and irregular shapes. Many samples also have surface layers such as paints or metal coatings. Elements Pb, Hg, As, Cd, Cr, Sb, Ba and Se in surface paint on children's products are now regulated according to threshold concentrations measured in ppm. Quantification of these elements in layer in ppm is another challenge for XRF methods since the thickness and density of the layers is unknown.

High-definition XRF (HDXRF) is an emergent XRF technique based on the use of multiple focusing monochromatic excitation beams. Because of the use of monochromatic excitation, HDXRF provides several unique advantages: a) improved detection limits, b) more simplified and accurate fundamental parameter based quantitative analysis, c) small beams to cope with small sample sizes and curved surfaces, and c) layer information derived from multiple monochromatic beams. In this paper, analysis of Pb, As, Cd, Hg, and other elements in various consumer products and environmental samples using HDXRF will be present and discussed.