

## **SCREENING TOYS AND CONSUMER GOODS WITH HANDHELD XRF**

Stanislaw Piorek, Thermo NITON Analyzers LLC, Billerica, MA

The problem of lead contamination in our environment is not new. Most recently, it resurfaced with increased intensity when, last summer, the Consumer Product Safety Commission (CPSC) initiated a wave of recalls for toys containing excessive amount of lead. Hundreds of thousands of popular toys were found to be decorated with paint containing more than 600 mg/kg of lead, and many children's articles such as furniture, jewelry, art supplies and even baby supplies contained thousands of mg/kg lead. As it turned out, the overwhelming majority of those "leaded" toys were manufactured in China.

Understandably, this situation has caused a nationwide public outcry and harsh criticism of the toy industry as well as the CPSC for not being vigilant enough in protecting the youngest and most vulnerable group of our society.

Those events uncovered gross deficiencies in existing testing protocols, and in the analytical methods for toy testing; they also exposed the inadequacy of the pertinent U.S. regulations. At the same time, it also became evident that toy manufacturers had lost control of their production processes, especially when the actual manufacturing of toys was subcontracted to factories in China.

In order to address the immediate problem of testing the massive number of recalled toys, the industry reached for the tried and field-proven analytical method of handheld x-ray fluorescence (XRF).

In this paper, we will address the problem of the gross inadequacy of the current test protocols based on the ICP or AA methods as they apply to toys' testing, and discuss the benefits and challenges of using the XRF technique to screen toys and consumer products for lead and other toxic elements. To complete the picture, we will discuss the existing U.S. and EU regulations limiting the levels of lead in toys and, finally, outline the legislative efforts to improve them.