APPLICATION NOTE

LIGHTIGO

Quality check of plastic eWaste using LIBS

Sample
Recycled plastics (eWaste)

Limits of Detection
100 ppm

Elements of interest
Cu, Sb, Cn, Pb

Spatial resolution
100 µm

Mode od analysis
Area scan

Measurement rate
20 Hz

Since the 1950s, the startling rate of plastic production has grown faster than that of any other material. In recent decades single-use plastic waste flood the world. This situation is unsustainable and smart plastic recycling seems to be the way out of this crisis. European Union is leading the action on plastic waste management when preventing further production of single-use plastics.

European legislative, via **REACH1**, **RoHS2** and **WEEE3** directive, strictly deals with chemical compounds (toxic metals and chemicals hazardous to human health and environment) added to plastic and electronic waste (eWaste) products. Producers and recyclers are under increasing pressure in terms of quality check of their products. LIBS technique has high potential to become an efficient analytical tool for this task.

FireFly instrument was utilized for large area scans to determine the averaged content of toxic metals (Cu, Pb, Cd and Sb) in various types of eWaste samples.

The analytical capability can be demonstrated by the calibration curve acquired for the Pb (Fig. 1.) content. The sensitivity is high enough to determine Pb content both above and bellow allowed EU RoHS2 threshold level.

These results makes LIBS a suitable analytical technique for this application. Discrimination and quantification of toxic substances in recycled plastics can be perfomerd on large sample areas quickly and efficiently.

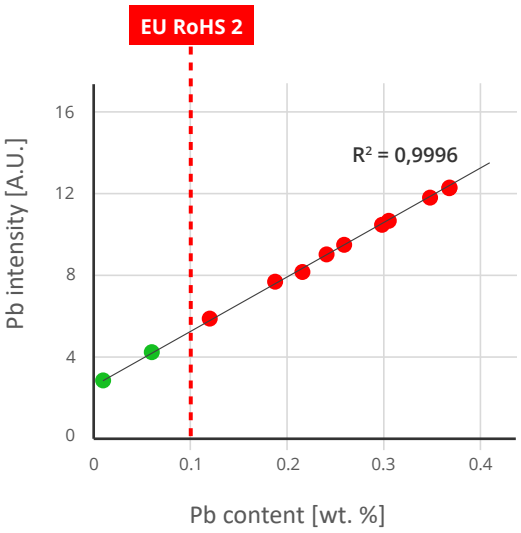

Fig. 1. Pb calibration curve with marked allowed Pb content threshold.

PLASTICS TISSUES GEOLOGY BIOLOGY METALS OTHERS