

Newly Developed XRF (X-Ray Fluorescence Spectrometer) Reference Standard Material Targets Low-High Content of Heavy Metals Analysis

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This research describes, in detail, the properties and application of newly developed eight Reference Standard Soils (ME1 Group) for XRF analysis including, experimental design, and the element analysis methods used to provide certified, reference, and information mass fraction values for 63 to 208 trace element constituents. The accuracy and detection limit of the analysis of heavy metals are affected by instrument, method and data processing error. XRF analysis of heavy metal is one of the time and cost savings process compare to conventional ICP-MS. The total number of portable XRF has been over 45000 all over the world at the stage of year 2010. Soil Standard has been used worldwide for the determination of major, minor, and trace element content of soils and similar materials. For precise results by XRF analysis high quality soil sample for calibration line preparation is mandatory. We succeeded to develop Reference Standard Materials for the determination of heavy metals in highly contaminated soil from the trace amount to high content (1 ppm –20000 ppm) by extending calibration line. Emphasis is placed on determination of priority pollutant elements (e.g., Cu, Zn, As, Cd, Pb). No chemicals are added to prepare Reference Soil. These New Reference materials provide the highly precise XRF results equivalent to ICP-MS data that cover the element mass fraction ranges that would be expected in typical soil samples analyzed by environmental research sections.

Keywords: Reference Standard Soils, XRF, Heavy Metals, High Concentration

