

METHOD VALIDATION FOR QUALIFICATION OF THE ALUMINIUM POWDER USED IN NUCLEAR FUEL MATERIAL BY WDXRF TECHNIQUE

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Abstract

The nuclear fuel MTR-type (Material Testing Reactor) used in the nuclear research reactors is produced briefly begins with mixing powder of enriched uranium silicide (U_3Si_2) 20% U_{235} with aluminum powder (purity > 99%) on pre-determined proportions. The characterization of the aluminum has been made by impurities determination such as Cd, Co, Cu, Fe, Si, Mn, Zn, Al_{total} and others. The WDXRF allows multi-elemental and non-destructive analysis and does not require chemical treatments in the sample preparation; these are advantages that minimize error sources. In addition, quantitative determinations without selective calibration curves allow rapid testing and cost less. The objective of this study is to validate the methodology for the impurities and Al_{total} determination in metal aluminum powder by wavelength-dispersive X-ray fluorescence spectrometry (WDXRF), in accordingly to ISO 17025.

Key Words: Validation; WDXRF; Aluminium