

Reference material analysis as an important tool for validation and quality assurance for ISO/IEC 17025 testing accreditation at the IPEN Neutron Activation Laboratory, São Paulo, Brazil

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National and international commercial interchange barriers can emerge if quality requirements are not met. To overcome this difficulty, public and private organizations require that laboratories involved in their product characterization demonstrate reliability in their analytical results. For international acceptance of the decisions based on these results, accredited laboratories should be chosen. IPEN Neutron Activation Analysis Laboratory (LAN) is implementing a Quality Management System (QMS) in order to accreditate the laboratory testing by Brazilian Metrological Institute (INMETRO), based on the ISO/IEC 17025: 2001 criteria. This QMS includes element determination in different matrices such as geological, biological, industrial and environmental samples by neutron activation analysis (NAA). The aim of this paper is to present the results obtained in the method validation and quality assurance steps of the QMS implementation related to certified reference material (CRM) analyses. Elements such as As, Br, Ca, Cu, Cs, Fe, K, Na, Rb, Sb, Sc, Se, Th, U, Zn and Rare Earths have been systematically analyzed in CRM from different matrices such as Orchard Leaves (NIST-SRM-1571), Lichen (IAEA 336), Human Hair (NIES 086), Whole Milk Powder (NIST-RM-8435), Typical Diet (NIST-SRM-1548a), Bovine Liver (NIST-SRM-1577b), Stainless Steel (IPT 24), Soil 7 (IAEA) and Buffalo River Sediment (NIST-SRM-2704). The laboratory performance was statistically evaluated (Z-score) in relation to certified or assigned values. As a general trend, Z-score values ($|Z| < 2$) were obtained for most elements confirming the good quality of the analytical results.