

Quality control and performance evaluation of k_0 -based neutron activation analysis laboratory using SRM-NIST

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Abstract

Quality evaluation of the k_0 -standardized neutron activation analysis (k_0 -NAA) at Es-Salam research reactor has been implemented by analyzing SRM-NIST, the standard reference material of National Institute of Standards and Technology (USA). Four SRM such as: Tomato leaves, Estuarine sediment, rice flour and oyster tissue have been analyzed by k_0 -NAA method. The results revealed that the k_0 -NAA established in our laboratory has met the requirements of multi-element analysis for the intended applications with about 32 elements: As, Au, Ba, Br, Ca, Ce, Co, Cr, Cs, Eu, Fe, Hf, K, La, Mn, Mo, Na, Nd, Rb, Sb, Sc, Se, Sm, Sr, Ta, Tb, Th, U, W, Yb, Zn and Zr in matrices of environment, geology and biology among others. Evaluation criteria for the laboratory quality used in this work are the statistical analysis parameters namely: u -scores, laboratory result/certified value ratios and relative biases as well as the control charts those are shown in the paper.

Keywords: Quality control, Performance, neutron activation, SRM-NIST